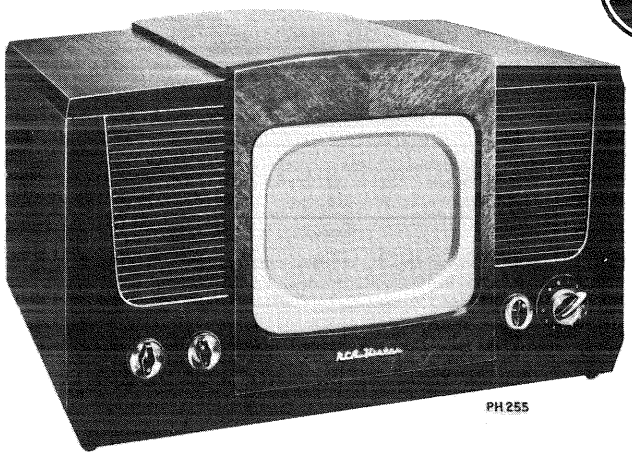



*Model 8TS30*
*Walnut, Mahogany or Toasted Mahogany*

# RCA VICTOR
# TELEVISION RECEIVER MODEL 8TS30

**Chassis No. KCS 20J-1 (60 cycles) and KCS 20K-2 (50 cycles)—Mfr. No. 274**

# SERVICE DATA

**— 1948 No. T1 —**

RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

## GENERAL DESCRIPTION

Model 8TS30 is a thirty-tube, direct-viewing, 10" table model, Television Receiver. The receiver is complete in one unit and is operated by the use of seven front-panel controls. Features of the receiver include: Full thirteen channel coverage; F-M sound system; Improved picture brilliance; A-F-C horizontal hold; Stabilized vertical hold; Two stages of video amplification; Noise saturation circuits; Three stage sync separator and clipper; Four mc. band width for picture channel, and Reduced hazard high voltage supply.

## ELECTRICAL AND MECHANICAL SPECIFICATIONS

**PICTURE SIZE** ..... 6⅝" x 8½"—2" radius at corner

**R-F FREQUENCY RANGES**

| Channel Number | Channel Freq. Mc. | Picture Carrier Freq. Mc. | Sound Carrier Freq Mc. | Receiver R-F Osc. Freq. Mc. |
|---|---|---|---|---|
| 1 | 44-50 | 45.25 | 49.75 | 71 |
| 2 | 54-60 | 55.25 | 59.75 | 81 |
| 3 | 60-66 | 61.25 | 65.75 | 87 |
| 4 | 66-72 | 67.25 | 71.75 | 93 |
| 5 | 76-82 | 77.25 | 81.75 | 103 |
| 6 | 82-88 | 83.25 | 87.75 | 109 |
| 7 | 174-180 | 175.25 | 179.75 | 201 |
| 8 | 180-186 | 181.25 | 185.75 | 207 |
| 9 | 186-192 | 187.25 | 191.75 | 213 |
| 10 | 192-198 | 193.25 | 197.75 | 219 |
| 11 | 198-204 | 199.25 | 203.75 | 225 |
| 12 | 204-210 | 205.25 | 209.75 | 231 |
| 13 | 210-216 | 211.25 | 215.75 | 237 |

**FINE TUNING RANGE**

Plus and minus approximately 300 kc on channel 1 and plus and minus approximately 750 kc on channel 13.

**POWER SUPPLY RATING**

KCS 20J-1 ..... 115 volts,, 60 cycles, 320 watts
KCS 20K-2 ..... 115 volts, 50 cycles, 320 watts

**AUDIO POWER OUTPUT RATING**

Undistorted ..... 2.5 watts
Maximum ..... 4 watts

**LOUDSPEAKER (92573-2)**

Type ..... 5 x 7 inch Permanent Magnet Dynamic
Voice Coil Impedance ..... 3.2 ohms at 400 cycles

**WEIGHT**

Chassis with Tubes in Cabinet (less Kinescope) ..... 80 lbs.
Shipping Weight ..... 93 lbs.

**RECEIVER ANTENNA INPUT IMPEDANCE.** .300 ohms balanced

| DIMENSIONS (inches) | Length | Height | Depth |
|---|---|---|---|
| Cabinet (Outside ..... | 26 | 14½ | 19 |
| Chassis Base (Outside) ..... | 19¼ | 3¾ | 15½ |
| Chassis Overall ..... | 21¾ | 11¾ | 16⅛ |

**RCA TUBE COMPLEMENT**

| | Tube Used | Function |
|---|---|---|
| (1) | RCA 6J6 | R-F Amplifier |
| (2) | RCA 6J6 | R-F Oscillator |
| (3) | RCA 6J6 | Converter |
| (4) | RCA 6BA6 | 1st Sound I-F Amplifier |
| (5) | RCA 6BA6 | 2nd Sound I-F Amplifier |
| (6) | RCA 6AU6 | 3rd Sound I-F Amplifier |
| (7) | RCA 6AL5 | Sound Discriminator |
| (8) | RCA 6AT6 | 1st Audio Amplifier |
| (9) | RCA 6K6GT | Audio Output |
| (10) | RCA 6AG5 | 1st Picture I-F Amplifier |
| (11) | RCA 6AG5 | 2nd Picture I-F Amplifier |
| (12) | RCA 6AG5 | 3rd Picture I-F Amplifier |
| (13) | RCA 6AG5 | 4th Picture I-F Amplifier |
| (14) | RCA 6AL5 | Picture 2nd Detector and D-C Restorer |
| (15) | RCA 6AU6 | 1st Video Amplifier |
| (16) | RCA 6K6GT | 2nd Video Amplifier |
| (17) | RCA 6SK7 | 1st Sync Amplifier |
| (18) | RCA 6SH7 | Sync Separator |
| (19) | RCA 6SN7GT | 2nd Sync Amplifier and Horizontal Discharge |
| (20) | RCA 6J5 | Vertical Sweep Oscillator and Discharge |
| (21) | RCA 6K6GT | Vertical Sweep Output |
| (22) | RCA 6AL5 | Horizontal Sync Discriminator |
| (23) | RCA 6K6GT | Horizontal Sweep Oscillator |
| (24) | RCA 6AC7 | Horizontal Sweep Oscillator Control |
| (25) | RCA 6BG6G | Horizontal Sweep Output |
| (26) | RCA 5V4G | Horizontal Reaction Scanning |
| (27) | RCA 1B3-GT/8016 | High Voltage Rectifier |
| (28) | RCA 5U4G | Power Supply Rectifiers (2 tubes) |
| (29) | RCA 10BP4 | Kinescope |

Specifications continued on page 2

## ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

**PICTURE I-F FREQUENCIES**

| | |
|---|---|
| Picture Carrier Frequency | 25.75 Mc. |
| Adjacent Channel Sound Trap | 27.25 Mc. |
| Accompanying Sound Traps | 21.25 Mc. |
| Adjacent Channel Picture Carrier Trap | 19.75 Mc. |

**SOUND I-F FREQUENCIES**

| | |
|---|---|
| Sound Carrier Frequency | 21.25 Mc. |
| Sound Discriminator Band Width between peaks) | 350 kc |

**VIDEO RESPONSE** ..... To 4 Mc.

**FOCUS** ..... Magnetic

**SWEEP DEFLECTION** ..... Magnetic

**SCANNING** ..... Interlaced, 525 line

**HORIZONTAL SCANNING FREQUENCY** ..... 15,750 cps

**VERTICAL SCANNING FREQUENCY** ..... 60 cps

**FRAME FREQUENCY** (Picture Repetition Rate) ..... 30 cps

**OPERATING CONTROLS** (front panel)

Channel Selector, Fine Tuning ..... Dual Control Knobs

Picture, Sound Volume and On-Off Switch ..... Dual Control Knobs

Picture Horizontal Hold, Picture Vertical Hold ..... Dual Control Knobs

Brightness ..... Single Control Knob

**NON-OPERATING CONTROLS** not including r-f & i-f adjustments)

| | |
|---|---|
| Horizontal Centering | rear chassis adjustment |
| Vertical Centering | rear chassis adjustment |
| Width | rear chassis screwdriver adjustment |
| Height | rear chassis adjustment |
| Horizontal Linearity | top chassis screwdriver adjustment |
| Vertical Linearity | rear chassis adjustment |
| Horizontal Drive | rear chassis adjustment |
| Horizontal Oscillator Frequency | rear chassis adjustment |
| Horizontal Oscillator Phase | bottom chassis adjustment |
| Focus | rear chassis adjustment |
| Focus Coil | top chassis wing nut adjustment |
| Ion Trap Magnet | top chassis thumb screw adjustment |
| Deflection Coil | top chassis wing nut adjustment |

## HIGH VOLTAGE WARNING

**OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.**

## KINESCOPE HANDLING PRECAUTIONS

**DO NOT OPEN THE KINESCOPE SHIPPING CARTON, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.**

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For these reasons, kinescopes must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb—particularly that part at the rim of the viewing surface—must not be struck, scratched or subjected to more than moderate pressure at any time. In installation, if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

2. Set the STATION SELECTOR to the desired channel.

3. Turn the PICTURE control fully counter-clockwise.

4. Turn the BRIGHTNESS control clockwise, until a glow appears on the screen then counter-clockwise until the glow just disappears.

5. Turn the PICTURE control clockwise until a glow or pattern appears on the screen.

6. Adjust the FINE TUNING control for best sound fidelity and SOUND VOLUME for suitable volume.

7. Adjust the VERTICAL hold control until the pattern stops vertical movement.

8. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

9. Adjust the PICTURE control for suitable picture contrast.

10. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

11. In switching from one station to another, it may be necessary to repeat steps number 6 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 6 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps number 1 through 9.

NOTE: If any difficulty is experienced with steps number 7 or 8, turn the PICTURE control ¼ turn counterclockwise and repeat those adjustments.

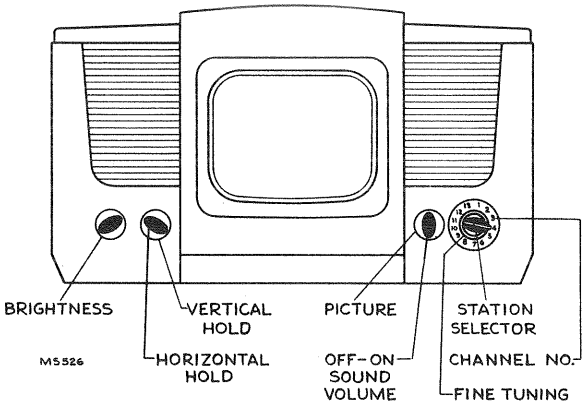



*Figure 1—Receiver Operating Controls*

## INSTALLATION INSTRUCTIONS

The Model 8TS30 television receiver is shipped complete in one carton except for the 10BP4 kinescope. The kinescope is shipped in a special carton and should not be unpacked until ready for installation.

**UNPACKING**—To unpack the receiver, tear open the carton bottom flaps, pick the receiver up from under the bottom of the cabinet and lift it out of the shipping carton.

The cabinet safety glass front panel is packed in a cardboard box. Remove the box and unpack the panel. Take off the cabinet top and back.

The operating control knobs are packed in a paper bag which is tied to the inside of the cabinet brace. Remove the bag.

Remove the protective cardboard shield from the 5U4G rectifier. Make sure all tubes are in place and are firmly seated in their sockets.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten. See Figure 2 for the location of the cushion and yoke adjustments.

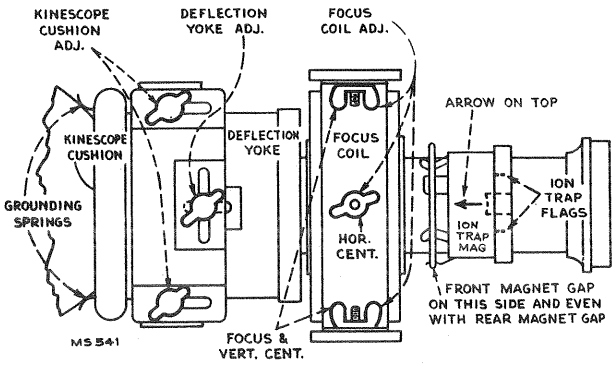



*Figure 2—Yoke and Focus Coil Adjustments*

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the three focus coil adjustment wingnuts and raise, lower, or rotate the coil until alignment is obtained. Tighten the wingnuts with the coil in this position.

Loosen the two lower kinescope face centering slides, and set them at approximately mid position. See Figure 3 for location of the slides and their adjustment screws.

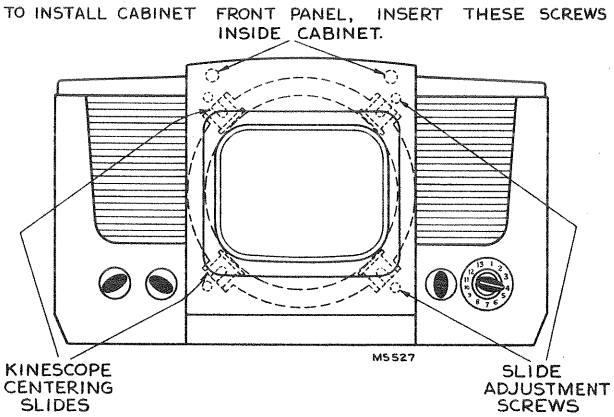



*Figure 3—Cabinet, Front View*

**KINESCOPE HANDLING PRECAUTION—Do not open the kinescope shipping carton, install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling. The shipping carton should be kept for use in case of future moves.**

**INSTALLATION OF KINESCOPE**—The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is approximately on top. The final orientation of the tube will be determined by the position of the ion trap flags. Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags, as shown in Figure 4. The kinescope must be installed so that when looking down on the chassis, the two flags will be seen as shown in Figure 2.

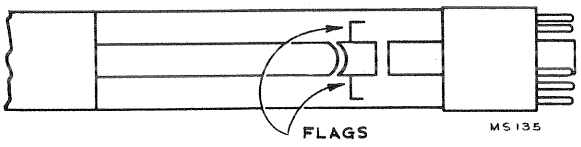



*Figure 4—Ion Trap Flags*

Insert the neck of the kinescope through the deflection and focus coils as shown in Figure 5 until the base of the tube protrudes approximately two inches beyond the focus coil. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

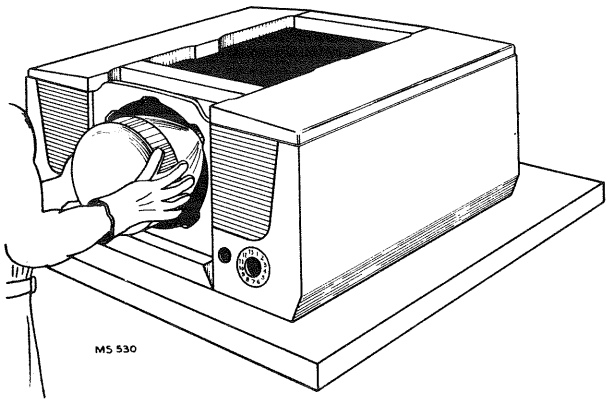



*Figure 5—Kinescope Insertion*

Early production receivers employed an EM type of ion trap magnet like that in the model 630TS receiver. Late production receivers employed a PM type magnet as shown in Figure 2.

If an EM type of magnet is applied, slip the assembly over the neck of the kinescope with the coils down and the large coil towards the base of the tube. Tighten the magnet adjustment thumbscrews sufficiently to hold it in position but still free enough to permit adjustment.

If the PM type is employed, slip the assembly over the neck of the kinescope with the large magnet towards the base of the tube and with the arrow on the assembly up as shown in Figure 2. The front magnet is movable on the assembly. The correct position of the front magnet is with the gap on the left side (from the rear of the cabinet) and even with the gap of the rear magnet.

Connect the kinescope socket to the tube base. Insert the kinescope until the face of the tube protrudes approximately one-quarter of an inch outside the front of the cabinet. Adjust the four centering slides until the face of the kinescope is in the center of the cabinet opening. Tighten the four slides securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel as indicated in Figure 3.

To install the front panel place the lip on the bottom of the panel in the recess below the kinescope opening and push the top in. Insert the two screws from the bag with the knobs into the back of panel as shown in Figure 3.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. Connect the high voltage lead to the kinescope second anode socket.

The antenna and power connections should now be made. Turn the power switch to the "on" position, the brightness control fully clockwise, and picture control counter-clockwise.

**ION TRAP MAGNET ADJUSTMENT**—The ion trap rear magnet poles should be approximately over the ion trap flags as shown in Figure 2. Starting from this position adjust the magnet by moving it forwards or backwards at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (R184 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

**FOCUS COIL ADJUSTMENTS**—Turn the centering controls R181 and R211 to mid position. See Figure 6 for location of these rear apron controls.

If a corner of the raster is shadowed, it indicates that the electron beam is striking the neck of the tube. Loosen the focus coil adjustment wing nuts and rotate the coil about its vertical and horizontal axis until the entire raster is visible, approximately centered and with no shadowed corners. Tighten the focus coil adjustment wing nuts with the coil in this position.

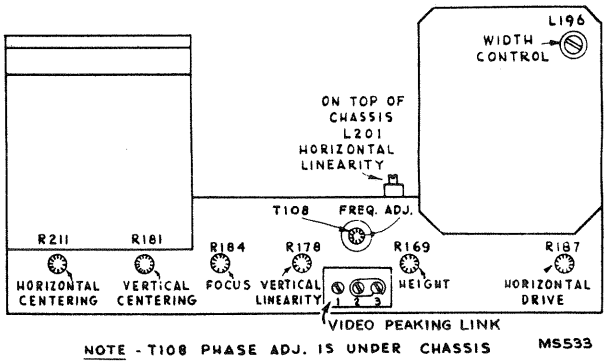



*Figure 6—Rear Chassis Adjustments*

**DEFLECTION YOKE ADJUSTMENT**—If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

**PICTURE ADJUSTMENTS**—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 2 through 9 and the note of the receiver operating instructions on page 3.

**CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT**—Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will pull into sync. Turn the horizontal hold control to the extreme clockwise position. The picture should remain in sync. Momentarily remove the signal. Again the picture should normally pull into sync.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator and proceed with 'FOCUS' adjustment."

**ALIGNMENT OF HORIZONTAL OSCILLATOR**—If in the above check the receiver failed to hold sync with the hold control at either extreme or failed to pull into sync after momentary removals of the signal, make the adjustments under "Slight Retouching Adjustments." If, after making these retouching adjustments, the receiver fails to pass the above checks or if the horizontal oscillator is completely out of adjustment, then make the adjustments under "Complete Realignment."

**Slight Retouching Adjustments**—Tune in a Television Station and adjust the fine tuning control for best sound quality. Sync the picture and adjust the picture control for slightly less than normal contrast. Turn the horizontal hold control to the extreme position in which the oscillator fails to hold or to pul in. Momentarily remove the signal. Turn the T108 frequency adjustment on the chassis rear apron until the oscillator pulls into sync. Check hold and pull-in for the other extreme position of the hold control.

**Complete Realignment**—Tune in a Television Station and adjust the fine tuning control for best sound quality.

Turn the T108 frequency adjustment on rear apron until the picture is synchronized. Adjust the picture control so that the picture is somewhat below average contrast level.

Turn the T108 phase adjustment screw (under chassis) until the blanking bar, which may appear in the picture, moves to the right and off the raster. The range of this adjustment is such that it is possible to hit an unstable condition (ripples in the raster). The screw must be turned clockwise from the unstable position. The length of stud beyond the bushing in its correct position is usually about ½ inch.

Turn horizontal hold to the extreme counter-clockwise position. Turn T108 frequency adjustment clockwise until the picture falls out of sync. Then turn it slowly counter-clockwise to the point where the picture falls in sync again.

Readjust T108 phase adjustment so that the left side of the picture is close to the left side of the raster, but does not begin to fold over.

Turn horizontal hold to the extreme clockwise position. The right side of the picture should be close to the right side of the raster, but should not begin to fold over. If it does, readjust the phase control.

Momentarily remove the signal. When the signal is restored, the picture should fall in sync. If it doesn't, turn T108 frequency adjustment counter-clockwise until the picture falls in sync.

Turn horizontal hold to the extreme counter-clockwise position. Remove the signal momentarily. When signal is restored, the picture should fall in sync.

NOTE: If the picture does not pull in sync after momentary removals of the signal in both extreme positions of horizontal hold, the pull-in range may be inadequate, though not necessarily. A pull-in through ¾ of the hold control range may still be satisfactory.

There is a difference between the pull-in range and hold-in range of frequencies. Once in sync, the circuit will hold about 50% to 100% more variation in frequency than it can pull in. The range of the horizontal hold control is only approximately equal to the pull-in range, considerable variation may be found due to variations in the cut-off characteristic of the horizontal oscillator control tubes, V124.

**FOCUS**—Adjust the focus control R184 for maximum definition of tho vertical wedge of the test pattern.

**HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS**—Adjust the height control (R169 on chassis rear apron) until the picture fills the mask vertically (6⅜ inches). Adjust vertical linearity (R178 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust vertical centering to align the picture with the mask.

**WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS**—Turn the horizontal drive (R187 on rear apron) clockwise as far as possible without causing crowding of the right of the picture. This position provides maximum high voltage to the kinescope second anode. Adjust the width control (L196 on rear chassis) until the picture just fills the mask horizontally (8½ inches). Adjust the horizontal linearity control L201 (see Figure 6) until the test pattern is symmetrical left to right. A slight readjustment of the horizontal drive control may be necessary when the linearity control is used. Adjust horizontal centering to align the picture with the mask.

If repeated adjustments of drive width and linearity fail to give proper linearity, it may be necessary to move the tap on R209, which is located in the high voltage compartment. Adjustments of drive, width and linearity must then be repeated. **Check to see that all cushion, yoke, focus coil and ion trap magnet thumb screws are tight.** Replace the cabinet back and top. Make sure that the back is on tight, otherwise it may rattle at high volume.

**CHECK OF R-F OSCILLATOR ADJUSTMENTS**—With a crystal calibrated test oscillator or heterodyne frequency meter, check to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 8. The adjustments for channels 1 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 7. Adjustments for channels 6 and 13 are under the chassis.

**VIDEO PEAKING LINK**—A video peaking link is provided (see Figure 6) to permit changing the video response. If the pictures from the majority of stations look better with the link closed, (2-3 position) then the link should be placed in that position. However, if transients are produced on high contrast pictures then the link should be left open (1-2 position).

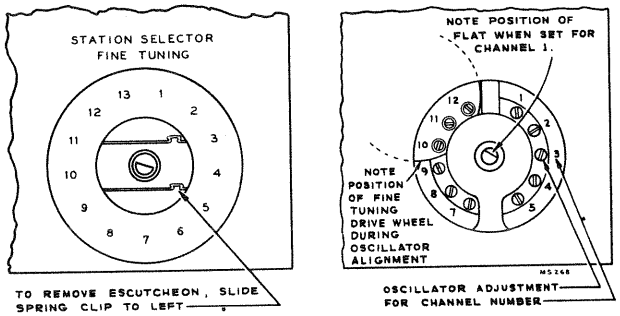



*Figure 7—R-F Oscillator Adjustments*

**ANTENNA TRAP**—In some instances interference may be encountered from FM stations that are on the image frequency of a television station. In other instances interference between two television stations may be observed.

Assume that two television stations in a city are operating on channels 6 and 10. When the receiver is tuned to channel 6, a small amount of the oscillator voltage (109 mc.) is present on the r-f amplifier grid. This 109 mc. voltage beats with the channel 10 picture carrier and produces an 84.25 mc. signal. This signal falls within the channel 6 range and interferes with the reception of channel 6. A similar case occurs between channels 5 and 7.

A series resonant trap across ther-f amplifier grid circuit is employed to remove theoscillator voltage from the grids and thus eliminate this type of interference.

To adjust the trap in the field, tune in the station on which the interference is observed. Tune both cores of the trap for minimum interference in the picture. See Figure 8 for the location of the trap. Keep both cores approximately the same by visual inspection. Then, turn one core ½ turn from the original position and repeak the second for maximum rejection. Repeat this process until the best rejection is obtained. For shop alignment of the trap see the alignment procedure on page 11.

In severe cases of interference, it may be necessary to reduce the signal from the interfering station by reorienting the antenna or by connecting a half wave stub of transmission line across the receiver antenna terminals. The end of the stub should be terminated by a 47 ohm, non inductive resistor.

# CHASSIS TOP VIEW

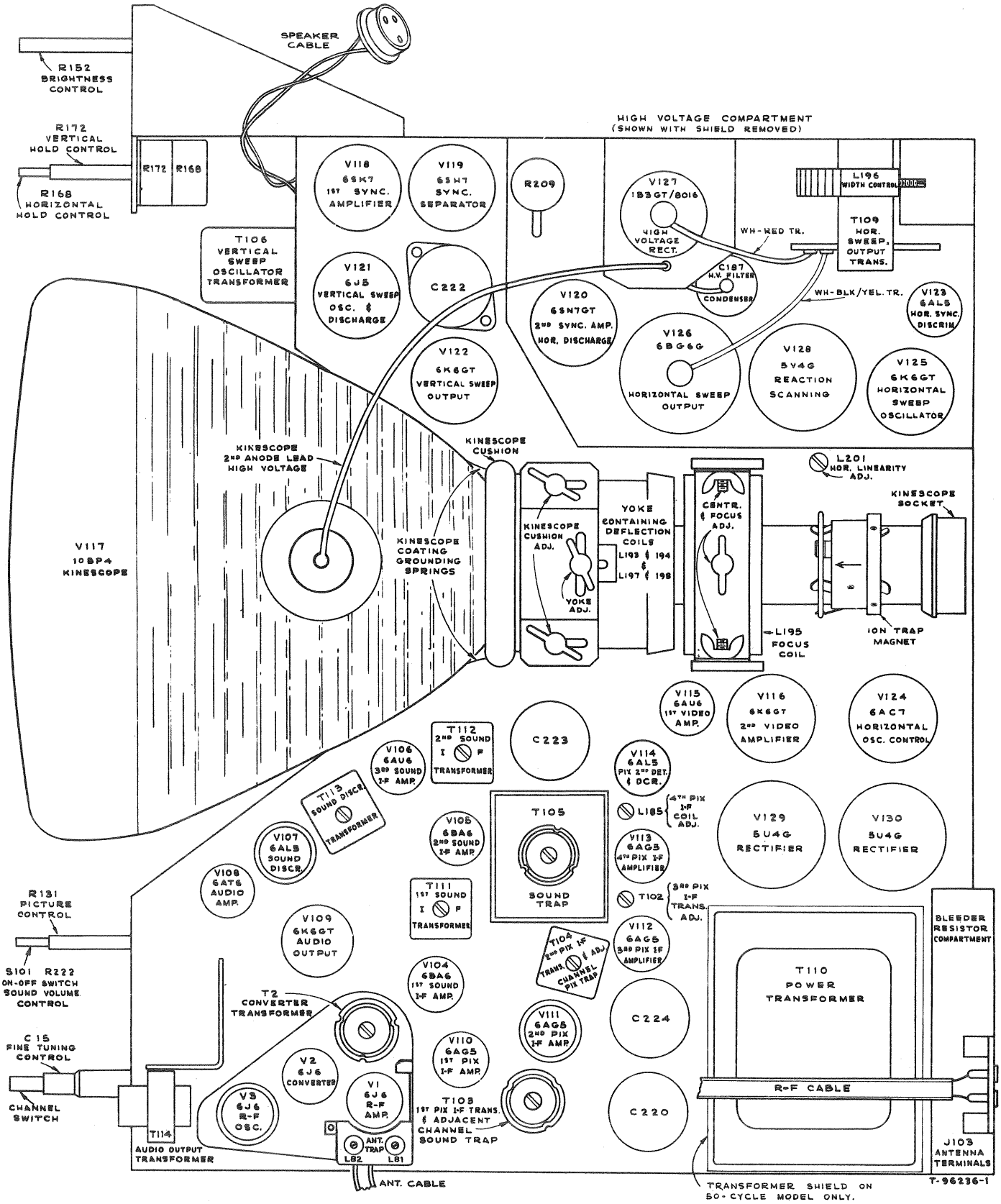



*Figure 8—Chassis Top View*

## CHASSIS BOTTOM VIEW

**8TS30**

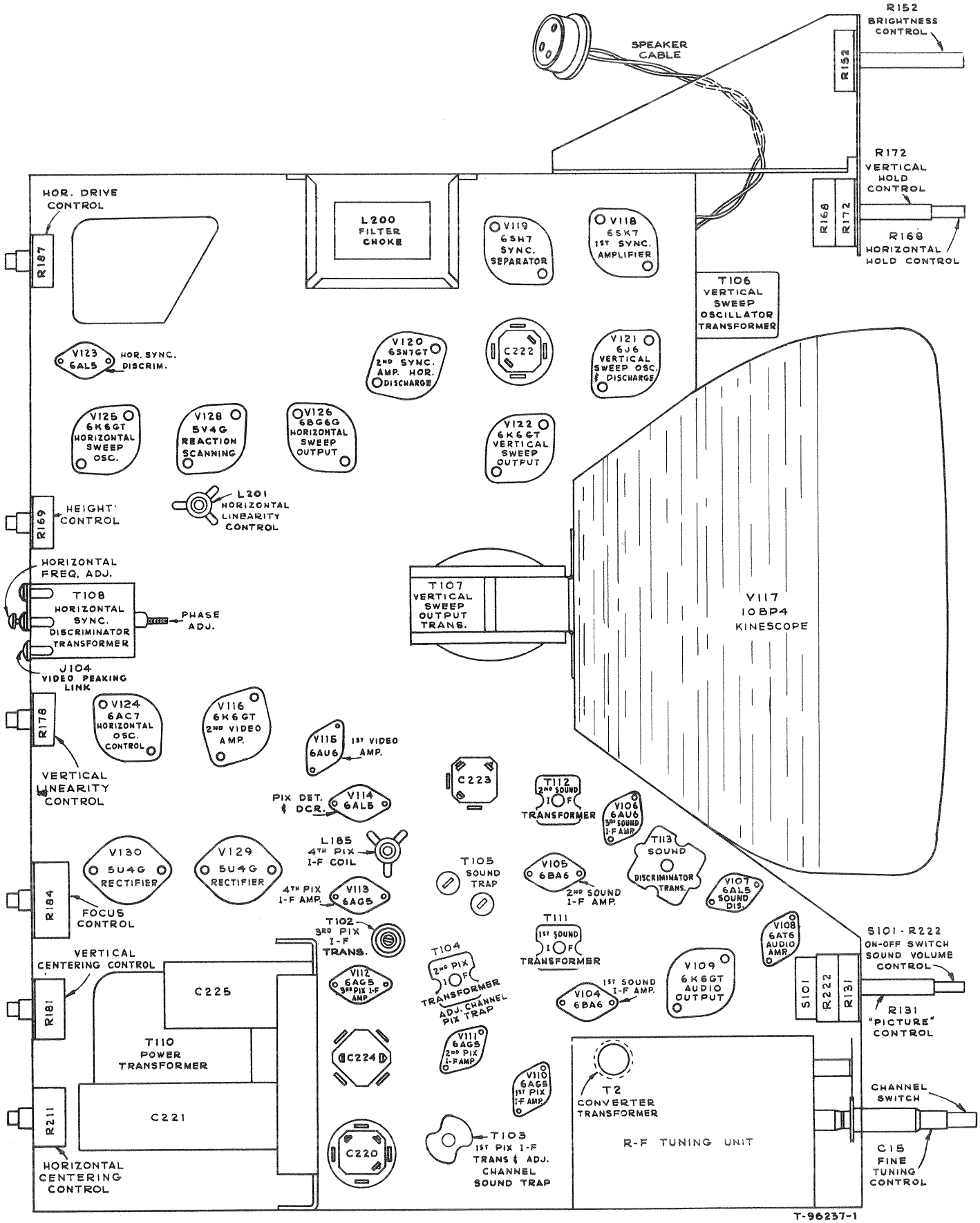



*Figure 9—Chassis Bottom View*

# ALIGNMENT PROCEDURE

**TEST EQUIPMENT**—To properly service the television chassis of this receiver, it is recommended that the following test equipment be available:

**R-F Sweep Generator** meeting the following requirements:

(a) Frequency Ranges
18 to 30 mc., 1 mc. sweep width
40 to 90 mc., 10 mc. sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

**Cathode-ray Oscilloscope**, preferably one with a wide band vertical deflection, an input calibrating source, and a low capacity probe.

**Signal Generator** to provide the following frequencies.

(a) I-F frequencies

19.75 mc. adjacent channel picture trap
21.25 mc. sound i-f and sound traps
21.8 mc. converter transformer
22.3 mc. second picture i-f transformer
23.4 mc. fourth picture i-f coil
25.2 mc. third picture i-f coil
25.3 mc. first picture i-f transformer
25 75 mc. picture carrier
27.25 mc. adjacent channel sound trap

(b) R-F frequencies

| Channel Number | Picture Carrier Freq. Mc. | Sound Carrier Freq. Mc. |
|---|---|---|
| 1 | 45.25 | 49.75 |
| 2 | 55.25 | 59.75 |
| 3 | 61.25 | 65.75 |
| 4 | 67.25 | 71.75 |
| 5 | 77.25 | 81.75 |
| 6 | 83.25 | 87.75 |
| 7 | 175.25 | 179.75 |
| 8 | 181.25 | 185.75 |
| 9 | 187.25 | 191.75 |
| 10 | 193.25 | 197.75 |
| 11 | 199.25 | 203.75 |
| 12 | 205.25 | 209.75 |
| 13 | 211.25 | 215.75 |

(c) Output on these ranges should be adjustable and at least .1 volt maximum.

**Heterodyne Frequency Meter** with crystal calibrator if the signal generator is not crystal controlled.

**Electronic Voltmeter** of Junior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 10 kv.

**Service Precautions**—If necessary to remove the chassis from cabinet, the kinescope must first be removed. See Figures 3 and 5. If possible, the chassis should then be serviced without the kinescope. However, if it is necessary to view the raster during servicing, the kinescope should be inserted only after the chassis is turned on end. The kinescope should never be allowed to support its weight by resting in the deflecting yoke. A bracket should be used to support the tube at its viewing screen.

By turning the chassis on end with the power transformer down, all adjustments will be made conveniently available. Since this is the only safe position in which the chassis will rest and still leave all adjustments accessible, the trimmer location drawings are oriented similarly for ease of use.

**CAUTION:** Do not short the kinescope second anode lead. Its short circuit current is approximately 3 ma. This represents approximately 9 watts dissipation and a considerable overload on the high voltage filter resistor R235.

**Adjustments Required**—Normally, only the r-f oscillator line will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require re-adjustment.

Due to the high frequencies at which the receiver operates the r-f oscillator line adjustment is critical and may be affected by a tube change. The line can be adjusted to proper frequency on channel 13 with practically any 6J6 tube in the oscillator socket. However, it may not then be possible to adjust the line to frequency on all of channels 7, 8, 9, 10, 11 and 12. To be satisfactory as an oscillator tube, it should be possible to adjust the line to proper frequency with the fine tuning control in the middle third of its range. It may therefore be necessary to select a tube for the oscillator socket. In replacing, if the old tube can be matched for frequency by trying several new ones, this practice is recommended. At best, however, it will probably be necessary to completely realign the oscillator line when changing the tube.

Tubes which cannot be used as oscillator will work satisfactorily as r-f amplifier or converter.

**ORDER OF ALIGNMENT**—When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

Sound discriminator
Sound i-f transformers
Picture i-f traps
Picture i-f transformers
R-F and converter lines
R-F oscillator line
Retouch picture i-f transformers
Antenna trap adjustment
Sensitivity check

**SOUND DISCRIMINATOR ALIGNMENT**—

Set the signal generator for approximately .1 volt output at 21.25 mc. and connect it to the third sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 10 volt scale.

Connect the meter in series with a one megohm resistor to the junction of diode resistors R219 and R220. Do not remove the discriminator shield to make connection to R219 and R220.

Connection can be easily made by fashioning a hook on the 1 meg resistor lead and making connection to the transformer lug "C" through the hole provided for the adjusting tool.

Adjust the primary of T113 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of R236 and C205. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the third sound i-f amplifier.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.25 and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of R236 and C205. The pattern obtained should be similar to that shown in Figure 16A. If it is not, adjust the T113 (top) until the wave form is symmetrical.

The peak to peak bandwidth of the discriminator should be approximately 350 kc. and it should be linear from 21.75 mc. to 21.325 mc.

**SOUND I-F ALIGNMENT—**

Connect the sweep oscillator to the second sound i-f amplifier grid.

Connect the oscilloscope to the third sound i-f grid return (terminal A T112) in series with a 33,000 ohm isolating resistor. Insert a 21.25 mc. marker signal from the signal generator into the second sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.25 mc. marker. The pattern obtained should be similar to that shown in Figure 16B.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the third sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

Connect the sweep and signal generator to the top end of the trap winding of T2 (on top of the chassis). Adjust T111 (top and bottom), for maximum gain and symmetry at 21.25 mc.

Reduce the sweep output for the final adjustments so that approximately .3 volt peak-to-peak is present at the third sound i-f grid return.

The band width at 70% response from the first sound i-f grid to the third i-f grid should be approximately 200 kc.

**PICTURE I-F TRAP ADJUSTMENT—**

Turn the receiver picture control for -3 volts on the picture i-f grids.

Set the channel switch to channel 13.

Connect the "VoltOhmyst" across the picture second detector load resistor R137.

Connect the output of the signal generator to the junction of C14 and R6. This connection is available on a terminal lug through a hole in the side apron of the chassis, beside the r-f unit. This hole is normally down when the chassis is in the recommended position. Connection can be easily made, however, by allowing the receiver to hang over the edge of the test bench by a few inches.

Set the generator to each of the following frequencies and tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency

21.25 mc.—T2 (top)
21.25 mc.—T105 (top)
27.25 mc.—T103 (top)
27.25 mc.—T102 (bottom)
19.75 mc.—T104 (top)

Note—On some sets, T102 bottom adjustment is omitted.

**PICTURE I-F TRANSFORMER ADJUSTMENTS—**

Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst."

21.8 mc.—T2 (bottom)
25.3 mc.—T103 (bottom)
22.3 mc.—T104 (bottom)
25.2 mc.—T102 (top of chassis)
23.4 mc.—L185 (top of chassis)

If T104 (bottom) required adjustment, it will be necessary to reset T104 (top) for minimum response at 19.75 mc.

Picture I-F Oscillation—If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage in excess of 3 volts at the picture detector load resistor. This voltage is unaffected by r-f signal input and sometimes is independent of picture control setting. If such a condition is encountered, it is sometimes possible to stop oscillation by adjusting the transformers approximately to frequency by setting the adjustment stud extensions of T2, T103, T104, T105, TT102, and L185 to be approximately equal to those of another receiver known to be in proper alignment. If this does not have the desired effect, it may now be possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align L185 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is very stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

**R-F AND CONVERTER LINE ADJUSTMENT—**

Connect the r-f sweep oscillator to the receiver antenna terminals. If the sweep oscillator has a 50 ohm single-ended output, it will be necessary to obtain balanced output by connecting as shown in Figure 10.

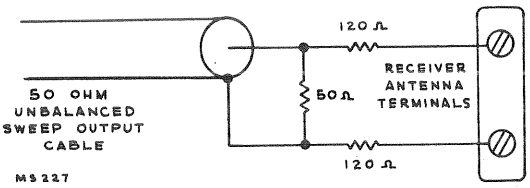



*Figure 10—Unbalanced Sweep Cable Termination*

Connect the oscilloscope to the junction of C14 and R6 (in the r-f tuning unit) through a 10,000 ohm resistor.

By-pass the first picture i-f grid to ground through a 1000 mmfd. capacitor. Keep the leads to this by-pass as short as possible. If this is not done, lead resonance may fall in the r-f range and cause an incorrect picture of the r-f response.

Turn the picture control for −1.5 volts on the r-f grids. Connect the signal generator loosely to the receiver antenna terminals.

Turn the antenna trap L81 and L82 cores fully counterclockwise so that the trap will not affect the channel 6 r-f response. Since channel 7 has the narrowest response of any of the

high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7 (see Figure 15 for switch shaft flat location versus channel).

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier 175.25 mc. and 179.75 mc.

Adjust L25, L26, L51 and L52 (see Figure 17) for an approximately flat topped response curve located symmetrically between the markers. Normally this curve appears somewhat overcoupled or double humped with a 10 or 15% peak to valley excursion and the markers occur at approximately 90% response. See Figure 17, channel 7. In making these adjustments, the stud extension of all cores should be kept approximately equal.

Check the response of channels 8 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observe the response obtained. See Figure 17 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 70% response. It the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L25, L26, L51 and L52, and possibly compromise some channel slightly in order to get the markers up on other channels. Normally however, no difficulty of this type should be experienced since the higher frequency channels become comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L11, L12, L37 and L38, for an approximately flat-topped response curve located symmetrically between the markers.

Check channels 5 down through channel 1 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 70% response point. If this is not the case, L11, L12, L37 and L38 should be retouched. On final adjustment, all channels must be within the 70% specification.

Coupling between r-f and converter lines is augmented by a link between L12 and L37. This link is adjusted in the factory and should not require adjustment in the field. On channel 6 with the link in the minimum coupling position, the response is slightly overcoupled with approximately a 10% excursion from peak-to-valley. With the coupling at maximum, the response is somewhat broader and the peak-to-valley excursion is approximately 40%. The amount of coupling permissible is limited by the peak-to-valley excursion which should not be greater than 30% on any channel.

**R-F OSCILLATOR LINE ADJUSTMENT—**

The r-f oscillator line may be aligned by adjusting it to beat with a crystal calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available.

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under sound carrier Freq. must be available.

| Channel Number | Receiver R-F Osc. Freq. Mc. | R-F Sound Carrier Freq. Mc. |
|---|---|---|
| 1 | 71 | 49.75 |
| 2 | 81 | 59.75 |
| 3 | 87 | 65.75 |
| 4 | 93 | 71.75 |
| 5 | 103 | 81.75 |
| 6 | 109 | 87.75 |
| 7 | 201 | 179.75 |
| 8 | 207 | 185.75 |
| 9 | 213 | 191.75 |
| 10 | 219 | 197.75 |
| 11 | 225 | 203.75 |
| 12 | 231 | 209.75 |
| 13 | 237 | 215.75 |

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "Volt-Ohmyst" to the sound discriminator output (junction of R236 and C205.

Connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

Since lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust L77 and L78 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. The core stud extensions should be maintained equal by visual inspection.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L76 for indications as above.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

**RETOUCHING OF PICTURE I-F ADJUSTMENTS—**

The picture i-f response curve varies somewhat with change of bias and for this reason it should be aligned with approxi-

mately the same signal input as it will receive in operation. If the receiver is located at the edge of the service area, it should be aligned with approximately −1 volt i-f grid bias. However, for normal conditions, (signals of 1000 microvolts or greater), it is recommended that the picture i-f be aligned with a grid bias of −3 volts.

Connect the r-f sweep generator to the receiver antenna terminals.

Connect the signal generator to the antenna terminals and feed in the 25.75 mc i-f picture carrier marker and a 22.3 mc marker.

Connect the oscilloscope across the picture detector load resistor.

Turn the picture control for −3 volts at its arm.

Set the sweep output to produce approximately .3 volt peak-to-peak across the picture detector load resistor.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 18.

If T104 (bottom) required any adjustment, it will be necessary to reset T104 (top) for minimum response at 19.75 mc.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped and with the 22.3 mc. marker at approximately 100% response.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the response curve, the picture definition is impaired by loss of high frequency video response. In making these adjustments, care should be taken that no two transformers are tuned to the same frequency as i-f oscillation may result.

**ANTENNA TRAP ALIGNMENT**—When the receiver is aligned in the shop, the antenna trap should be adjusted to reject the type of interference which might be encountered at the customer's home. It can be adjusted by actual observation of the interference on the air or by the use of a signal generator. Two methods of adjustment are possible if a signal generator is employed. Select the type of interference and method to suit the test equipment involved.

Method 1 for channel 6-10 interference. Set the "VoltOhmyst" on the 3 volt scale and connect it to the junction of L188 and R137. Turn the picture control to the maximum clockwise position. Connect the signal generator to the antenna terminals through balancing network as shown in Figure 10. Tune the receiver oscillator to 109 mc. with the fine tuning control as determined by the method employed in the previous section on r-f oscillator line adjustment. Feed in the channel 10 picture carrier (193.25 mc.) from the signal generator. Adjust L81 and L82 for minimum reading on the "VoltOhmyst," keeping both cores about the same. For final touches, adjust L81 one-half turn clockwise and readjust L82 for minimum on the meter. If this minimum is lower than the previous, repeat until the lowest minimum is obtained. If this minimum was higher, adjust L81 one-half turn counterclockwse and readjust L82. Repeat for the lowest minimum.

Method 2 for channel 6-10 interference. With the same setup as above, switch the receiver to channel 3 and tune the receiver oscillator to 87 mc. Feed in a signal of 109 mc. from the signal generator and adjust the trap as above.

Method 1 for channel 5-7 interference. With the same setup as above, switch the receiver to channel 5 and tune the receiver oscillator to 103 mc. Feed in the picture 7 sound carrier (179.75 mc.) from the signal generator and adjust the trap as above.

Method 2 for channel 5-7 interference. With the same setup as above, switch the receiver to channel 2 and tune the receiver oscillator to 81 mc. Feed in a 103 mc. signal from the generator and adjust the trap as above.

Method for FM image interference. With the same setup as above, switch the receiver to channel 2 and tune the receiver oscillator to 81 mc. Feed in a signal of the frequency of the interfering FM station and adjust the trap as before.

To adjust the trap by observation of the picture under actual operating conditions, connect an antenna to the receiver and tune in the station on which the interference is observed. Adjust the trap as above for minimum interference in the picture.

Since the customer's antenna will affect these adjustments slightly, in cases of severe interference it may be necessary to retouch the trap adjustment when the receiver is installed in the customer's home.

**SENSITIVITY CHECK**—A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through an attenuator pad of the type shown in Figure 11. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

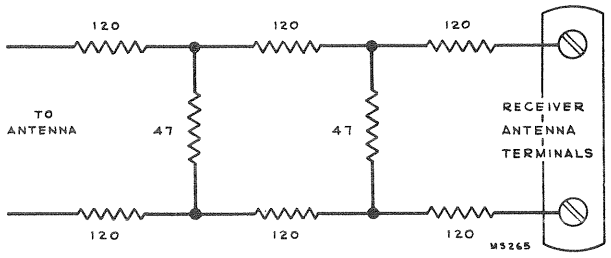



*Figure 11—Attenuator Pad*

**RESPONSE CURVES**—The response curves shown on page and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected. Channel 2 response (not shown) is similar to that of channel 3

**REFER TO PAGES 236 TO 243 INC. FOR RESPONSE CURVES, TEST PATTERN PHOTOGRAPHS, SERVICE SUGGESTIONS AND WAVEFORM PHOTOGRAPHS.**

**ALIGNMENT TABLE**—Both methods of oscillator alignment are presented in the alignment table. The service technician may thereby choose the method to suit his test equipment.

# 8TS30 ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 8 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED.

| STEP No. | CONNECT SIGNAL GENERATOR TO | SIGNAL GEN. FREQ. MC. | CONNECT SWEEP GENERATOR TO | SWEEP GEN. FREQ. MC. | CONNECT OSCILLOSCOPE TO | CONNECT "VOLTOHMYST" TO | MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS | ADJUST | REFER TO |
|---|---|---|---|---|---|---|---|---|---|
| | | | | DISCRIMINATOR AND SOUND I-F ALIGNMENT | | | | | |
| 1 | 3rd sound i-f grid (pin 1, V106) | 21.25 .1 volt output | Not used | | Not used | In series with 1 meg. to junction of R219 & R220 | | Detune T113 (bottom). Adjust T113 (top) for max. on meter | Fig. 14 Fig. 13 Fig. 12 |
| 2 | " | " | " | | " | Junct of R236 & C205 | Meter on 3 volt scale | T113 (bottom) for zero on meter | Fig. 14 Fig. 13 |
| 3 | " | " | 3rd sound i-f grid (pin 1, V106) | 21.25 center 1 mc. wide .1 v. out | Junction of R236 & C205 | Not used | Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal | | Fig. 14 Fig. 16 A |
| 4 | 2nd sound i-f grid (pin 1, V105) | 21.25 reduced output | 2nd sound i-f grid | 21.25 reduced output | Terminal A, T112 in series with 33,000 ohms | " | Sweep output reduced to provide .3 volt p-to-p on scope | T112 (top & bottom) for max. gain and symmetry at 21.25 mc. | Fig. 14 Fig. 12 Fig. 13 Fig. 16 B |
| 5 | Trap winding on T2 (top of chassis) | 21.25 reduced output | Trap winding on T2 | 21.25 reduced output | " | " | " | T111 (top & bottom) for max. gain and symmetry at 21.25 mc. | Fig. 12 Fig. 13 Fig. 14 Fig. 16 B |
| | | | | PICTURE I-F AND TRAP ADJUSTMENT | | | | | |
| 6 | Not used | | Not used | | Not used | Junction of R189 & R190 | | Picture control for -3 volts on meter | Fig. 14 |
| 7 | Junction C14 and R6 | 21.25 | " | | " | Junction of L188 & R137 | Meter on 3 volt scale. Receiver on channel 13 | T105 (top) for min. on meter | Fig. 12 |
| 8 | " | 21.25 | " | | " | " | " | T2 (top) for min. | Fig. 14 Fig. 12 |
| 9 | " | 27.25 | " | | " | " | " | T103 (top) for min. T102 (bot.) for min. | Fig. 12 Fig. 13 |
| 10 | " | 19.75 | " | | " | " | " | T104 (top) for min. | Fig. 12 |
| 11 | " | 21.8 | " | | " | " | " | T2 (bottom) for max. | Fig. 13 |
| 12 | " | 25.3 | " | | " | " | " | T103 (bottom) for max. | " |
| 13 | " | 22.3 | " | | " | " | " | T104 (bottom) for max. | " |
| 14 | " | 25.2 | " | | " | " | " | T102 (top chassis) for max. | Fig. 12 |
| 15 | " | 23.4 | " | | " | " | " | L185 (top chassis) for max. | " |
| 16 | If T104 (bottom) required adjustment in step 13, repeat step 10. | | | | | | | | |
| | | | | R-F AND CONVERTER LINE ALIGNMENT | | | | | |
| 17 | Not used | | Not used | | Not used | Pin 5 or 6 V108 | | Picture control for -1.5 volts on meter | Fig. 14 Fig. 13 |
| 18 | Antenna terminal (loosely) | 175.25 & 179.75 | Antenna terminals (see text for precaution) | Sweeping channel 7 | Junction C14 and R6 through 10,000 ohm series resistor | Not used | 1st i-f grid bypass to gnd. with 1000 mmf. Receiver on channel 7 | L25, L26, L51 & L52 for approx. flat top response between markers. Markers above 70% | Fig. 14 Fig. 13 Fig. 17 (7) |
| 19 | " | 181.25 185.75 | " | channel 8 | " | " | Receiver on channel 8 | Check to see that response is as above | Fig. 17 (8) |
| 20 | " | 187.25 191.75 | " | channel 9 | " | " | Receiver on channel 9 | " | Fig. 17 (9) |
| 21 | " | 193.25 197.75 | " | channel 10 | " | " | Receiver on channel 10 | " | Fig. 17 (10) |
| 22 | " | 199.25 203.75 | " | channel 11 | " | " | Receiver on channel 11 | " | Fig. 17 (11) |
| 23 | " | 205.25 209.75 | " | channel 12 | " | " | Receiver on channel 12 | " | Fig. 17 (12) |
| 24 | " | 211.25 215.75 | " | channel 13 | " | " | Receiver on channel 13 | " | Fig. 17 (13) |
| 25 | If the response on any channel (steps 19 through 24) is below 70% at either marker, switch to that channel and adjust L25, L26, L51, & L52 to pull response up on that channel. Then recheck steps 18 through 24. | | | | | | | | |

# ALIGNMENT TABLE

| STEP No. | CONNECT SIGNAL GENERATOR TO | SIGNAL GEN. FREQ. MC. | CONNECT SWEEP GENERATOR TO | SWEEP GEN. FREQ. MC. | CONNECT OSCILLOSCOPE TO | CONNECT "VOLTOHMYST" TO | MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS | ADJUST | REFER TO |
|---|---|---|---|---|---|---|---|---|---|
| | | | | R-F AND CONVERTER LINE ALIGNMENT (Cont'd) | | | | | |
| 26 | Antenna terminals (loosely) | 83.25<br>87.75 | Antenna terminals (see text for precaution) | Sweeping channel 6 | Junction C14 and R6 through 10,000 ohm series resistor | Not used | Receiver on channel 6 | L11, L12, L37 & L38 for response as above | Fig. 17 (6) |
| 27 | " | 77.25<br>81.75 | " | channel 5 | " | " | Receiver on channel 5 | Check to see that response is as above | Fig. 17 (5) |
| 28 | " | 67.25<br>71.75 | " | channel 4 | " | " | Receiver on channel 4 | " | Fig. 17 (4) |
| 29 | " | 61.25<br>65.75 | " | channel 3 | " | " | Receiver on channel 3 | " | Fig. 17 (3) |
| 30 | " | 55.25<br>59.75 | " | channel 2 | " | " | Receiver on channel 2 | " | |
| 31 | " | 45.25<br>49.75 | " | channel 1 | " | " | Receiver on channel 1 | " | Fig. 17 (1) |
| 32 | If the response on any channel (steps 27 through 31) is below 70% at either marker, switch to that channel and adjust L11, L12, L37 & L38 to pull response up on that channel. Then recheck steps 26 through 31. | | | | | | | | |
| | | | | R-F OSCILLATOR ALIGNMENT | | | | | |
| STEP No. | CONNECT SIGNAL GENERATOR TO | SIGNAL GEN. FREQ. MC. | CONNECT HETERODYNE FREQ. METER TO | HET. METER FREQ. MC. | CONNECT OSCILLOSCOPE TO | CONNECT "VOLTOHMYST" TO | MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS | ADJUST | REFER TO |
| 33 | Antenna terminals | 215.75 | Loosely coupled to r-f osc. | 237 | Not used | Junction of R236 & C205 for sig. gen. method only | Fine tuning centered for all adjustments<br>Receiver on channel 13 | L77 & L78 for zero on meter or beat on het. feq. meter | Fig. 14<br>Fig. 13 |
| 34 | " | 209.75 | " | 231 | " | " | Rec. on chan. 12 | L76 as above | Fig. 15 |
| 35 | " | 203.75 | " | 225 | " | " | Rec. on chan. 11 | L74 as above | " |
| 36 | " | 197.75 | " | 219 | " | " | Rec. on chan. 10 | L72 as above | " |
| 37 | " | 191.75 | " | 213 | " | " | Rec. on chan. 9 | L70 as above | " |
| 38 | " | 185.75 | " | 207 | " | " | Rec. on chan. 8 | L68 as above | " |
| 39 | " | 179.75 | " | 201 | " | " | Rec. on chan. 7 | L66 as above | " |
| 40 | " | 87.75 | " | 109 | " | " | Rec. on chan. 6 | L33 & L64 as above | Fig. 13 |
| 41 | " | 81.75 | " | 103 | " | " | Rec. on chan. 5 | L62 as above | Fig. 15 |
| 42 | " | 71.75 | " | 93 | " | " | Rec. on chan. 4 | L60 as above | " |
| 43 | " | 65.75 | " | 87 | " | " | Rec. on chan. 3 | L58 as above | " |
| 44 | " | 59.75 | " | 81 | " | " | Rec. on chan. 2 | L56 as above | " |
| 45 | " | 49.75 | " | 71 | " | " | Rec. on chan. 1 | L54 as above | " |
| 46 | Repeat steps 33 through 45 as a check. | | | | | | | | |
| | | | | RETOUCHING PICTURE I-F TRANSFORMERS | | | | | |
| 47 | | | Not used | | Not used | Junction of R189 & R190 | Receiver & sweep on a channel between 1 and 6 known to have good r-f response | Picture control for -3 volts on meter | Fig. 14 |
| 48 | Antenna terminals (loosely) | 22.3<br>25.75 | " | | Junction L188 and R137 | Not used | Retouch pix i-f adjustments (T2, T103, T104, bottoms T102 & L185 as necessary to provide proper response | | Fig. 14<br>Fig. 13<br>Fig. 18 |
| 49 | If T104 (bottom) was adjusted in step 48, repeat step 10 and step 48. | | | | | | | | |
| | | | | ANTENNA TRAP ADJUSTMENT | | | | | |
| | Select 1 of the 6 steps below for suitable method for type of interference encountered. | | | | | | | | |
| 50-1 | Antenna terminals through termination | 193.25 | Loosely coupled to r-f osc. | 109 | Not used | Junction of L188 & R137 | Rec. on chan. 6 | L81 & L82 for min. on meter | Fig. 14<br>Fig. 12 |
| 50-2 | " | 109 | " | 87 | " | " | Rec. on chan. 3 | " | " |
| 50-3 | " | 179.75 | " | 103 | " | " | Rec. on chan. 5 | " | " |
| 50-4 | " | 103 | " | 81 | " | " | Rec. on chan. 2 | " | " |
| 50-5 | " | FM Sta. Freq. | " | 81 | " | " | " | " | " |
| 50-6 | Not used | | Not used | | Not used | Not used | Rec. on interfered channel | L81 & L82 for min. interference | " |
| | | | | SENSITIVITY CHECK | | | | | |
| 51 | Connect antenna to receiver through attenuator pad to provide weak signal. Compare picture and sound obtained to that obtained on other receivers under the same conditions. | | | | | | | | |

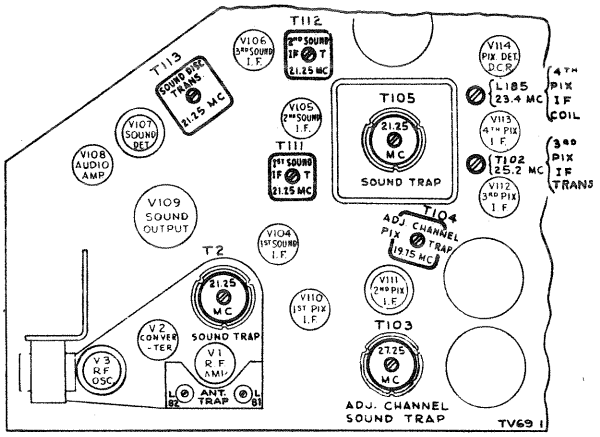
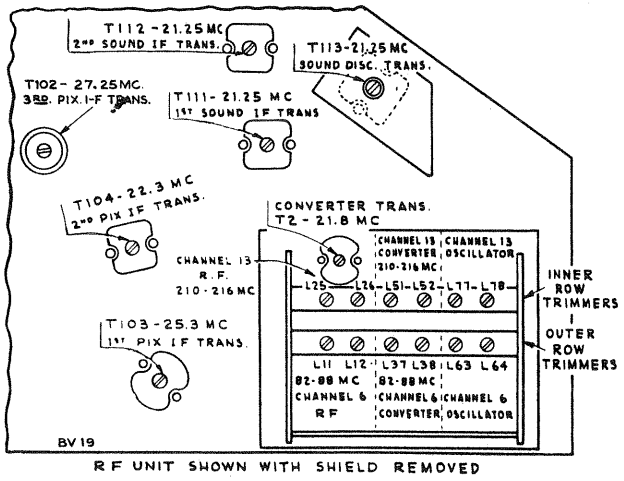



*Figure 12—Top Chassis Adjustments*




R F UNIT SHOWN WITH SHIELD REMOVED

*Figure 13—Bottom Chassis Adjustments*

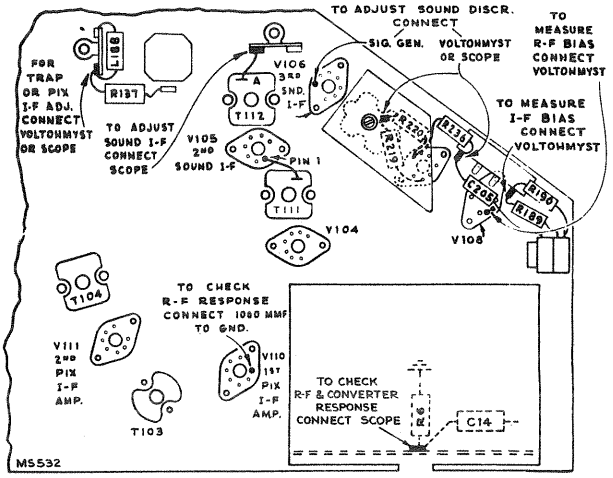
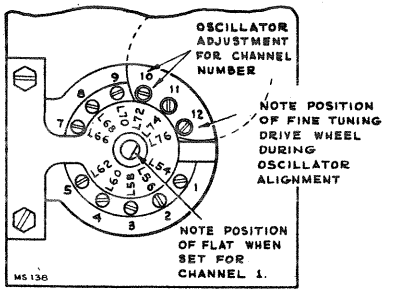



*Figure 14—Test Connection Points*




OSCILLATOR ADJUSTMENTS FOR CHANNELS 6 AND 13 ARE ON SIDE OF R.F. UNIT

*Figure 15—R-F Oscillator Adjustments*

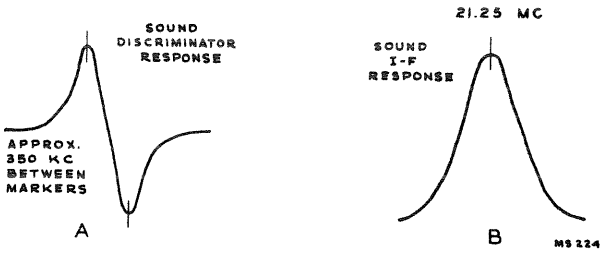



*Figure 16—Sound Discriminator and I-F Response*

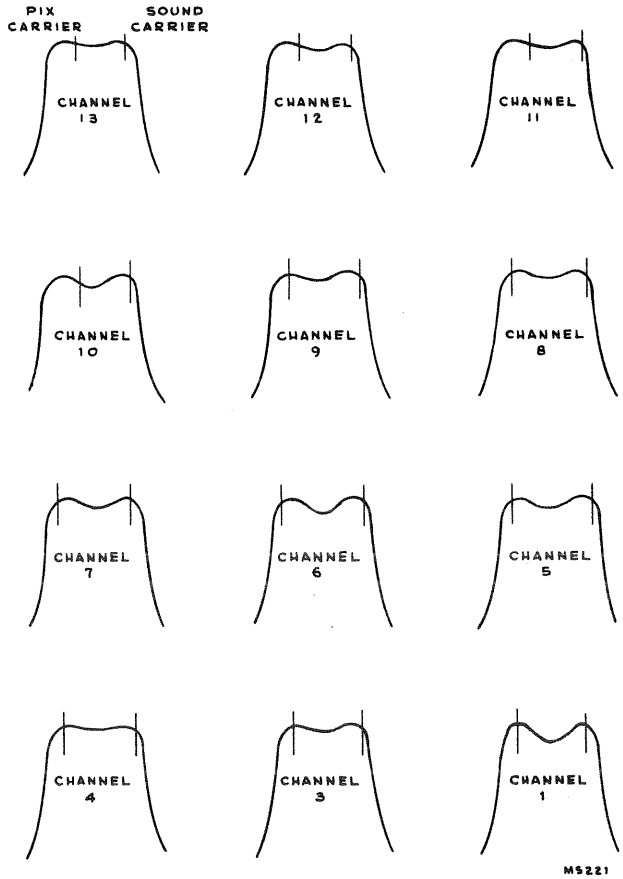



*Figure 17—R-F Response*

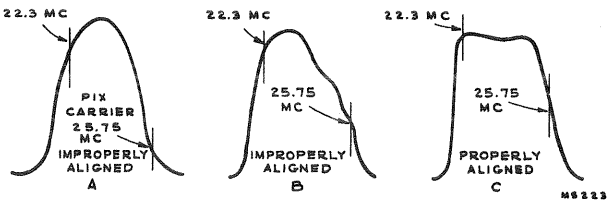



*Figure 18—Overall Response*

## CHASSIS WIRING DIA

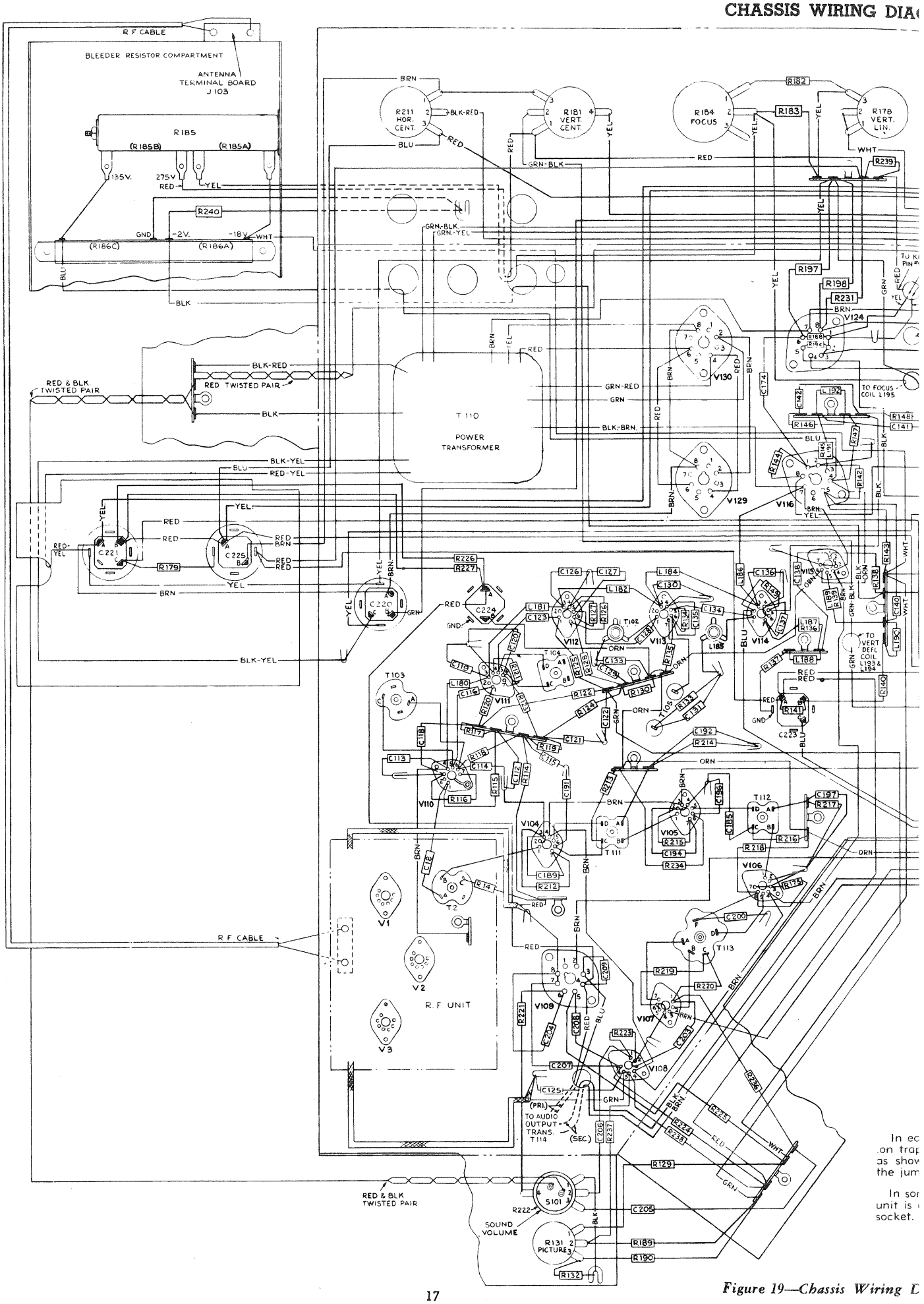
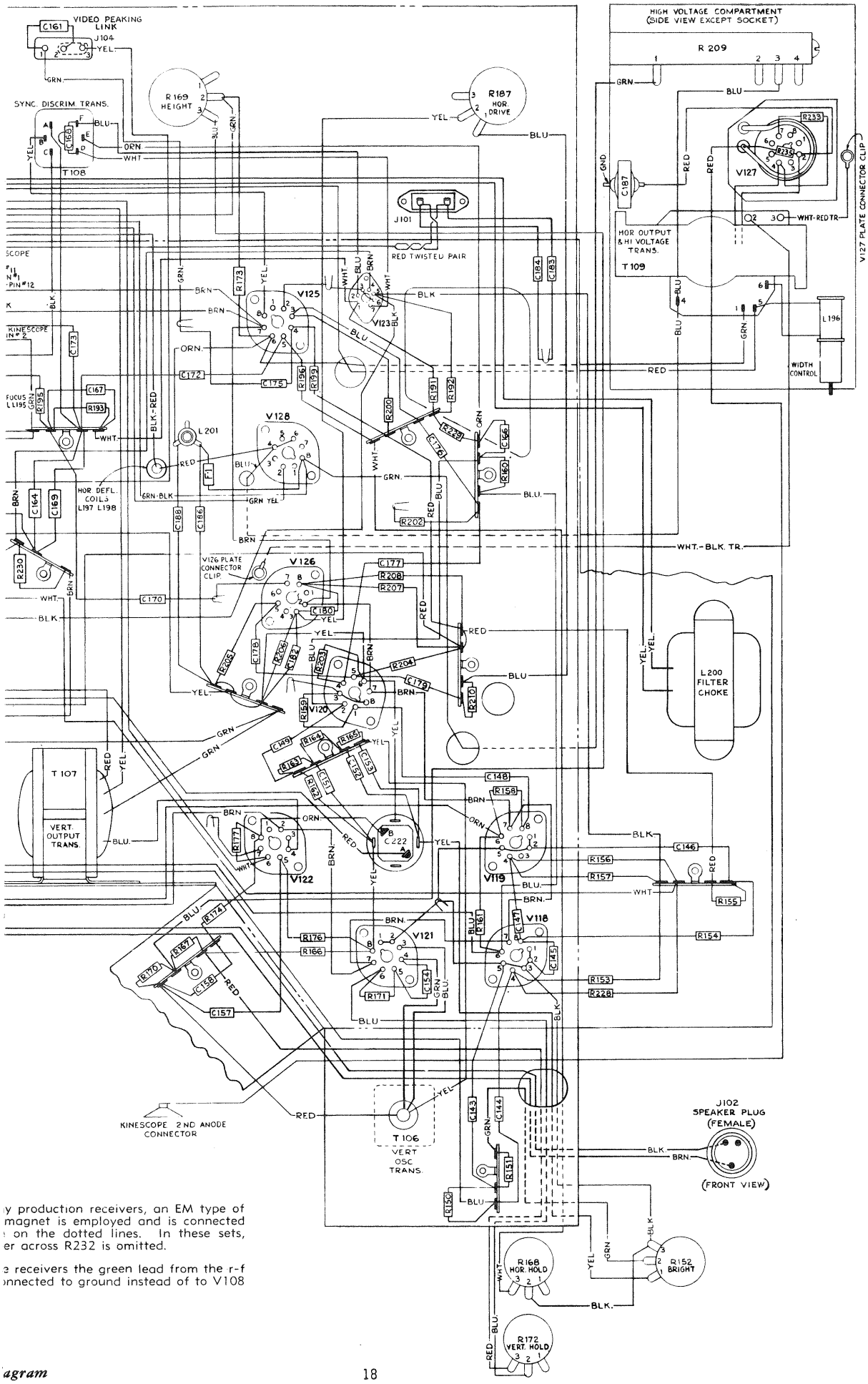
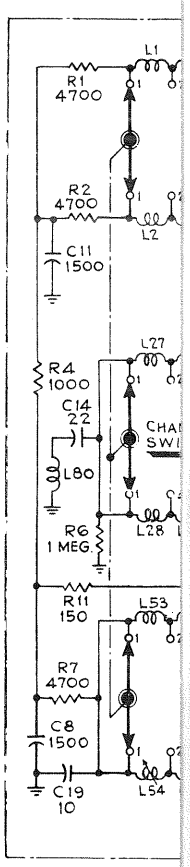



*Figure 19—Chassis Wiring D*

RAM 8TS30




y production receivers, an EM type of magnet is employed and is connected on the dotted lines. In these sets, er across R232 is omitted.

e receivers the green lead from the r-f nnected to ground instead of to V108

All resistance
Capacitance
above 1 in mmf

Direction of a
rotation.

All voltages
picture control
hold within ±20

In some rec
changes in com
lytic capacitor
markings.

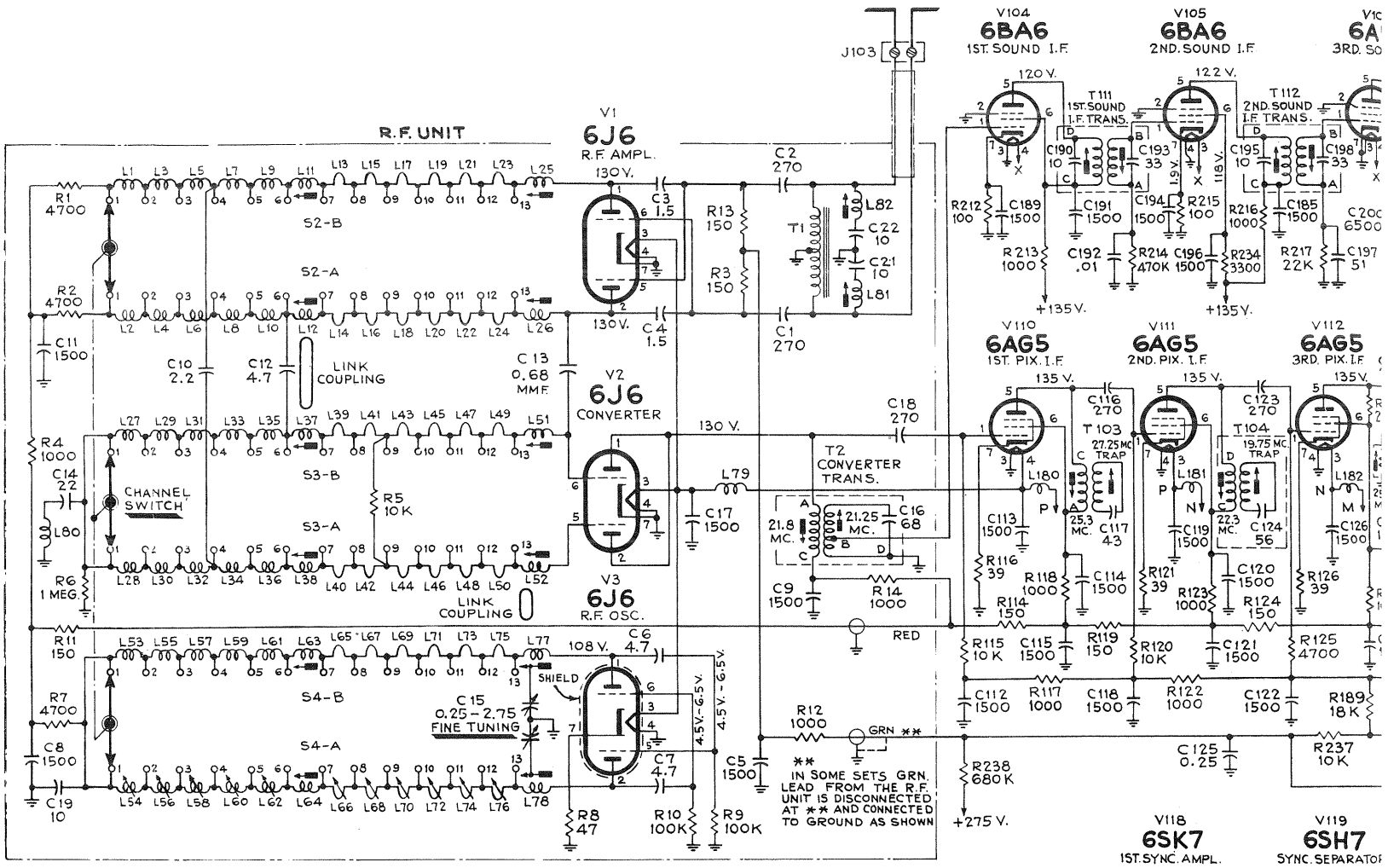
In some receiv
and C 22) may b

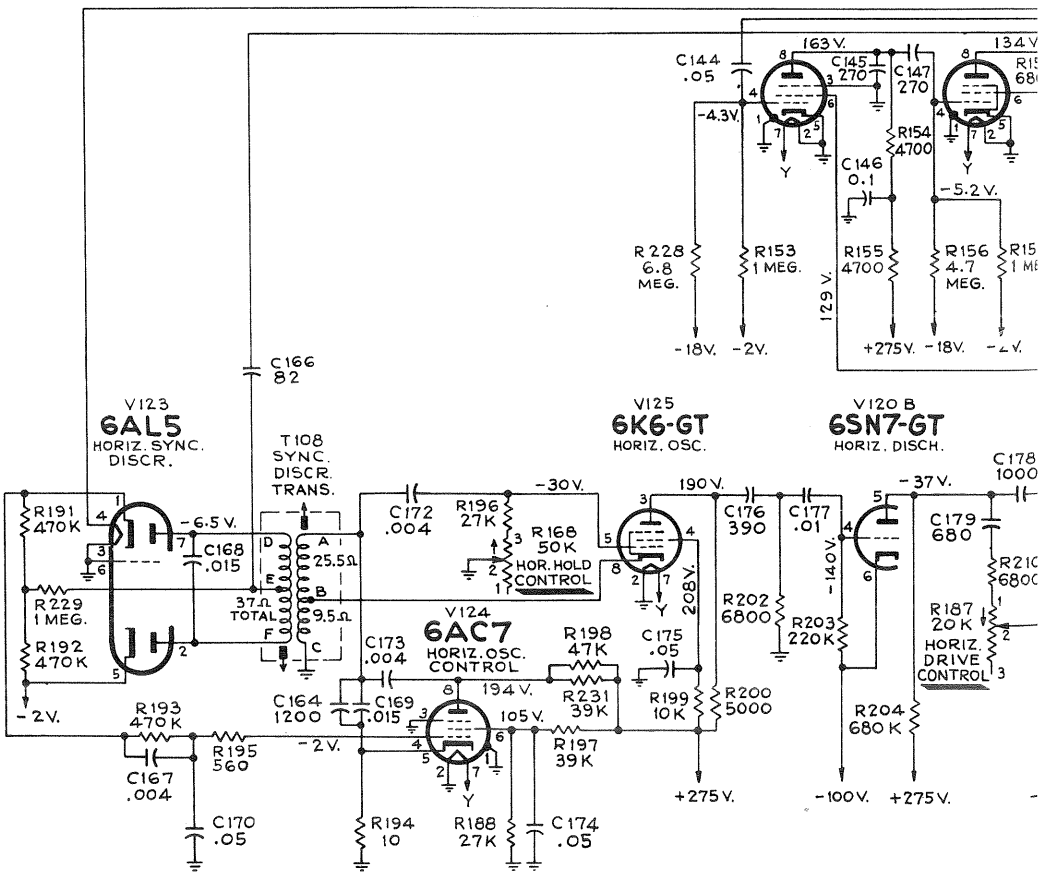
In some receiv
is employed. In
shunting resistor
the dotted lines
jumper across R2

In some receiv
is connected to g
ference. In this
on signals in ex
signals are prese
the lead as shov
the receiver by
mission line.

In some receiv
omitted.

In some receiv




## NOTES

All resistance values are in ohms. K = 1000. Capacitance values less than 1 are in mfd. and above 1 in mmfd., unless otherwise noted.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with VoltOhmyst and with picture control counterclockwise. Voltages should hold within ±20% with 117 v. a-c supply.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

In some receivers, the antenna trap (L81, L82, C21 and C 22) may be omitted.

In some receivers, on EM type of ion trap magnet is employed. In these sets, the magnet coils and the shunting resistor R232 are connected as shown by the dotted lines of the schematic. In this case, the jumper across R232 is omitted.

In some receivers, the green lead from the r-f unit is connected to ground to minimize interchannel interference. In this condition the receiver will overload on signals in excess of 15,000 microvolts. If such signals are present, it will be necessary to reconnect the lead as shown or to reduce the signal input to the receiver by a pad or stub on the antenna transmission line.

In some receivers, the trap winding on T102 is omitted.

In some receivers, the fuse F1 is omitted.

# ATIC DIAGRAM

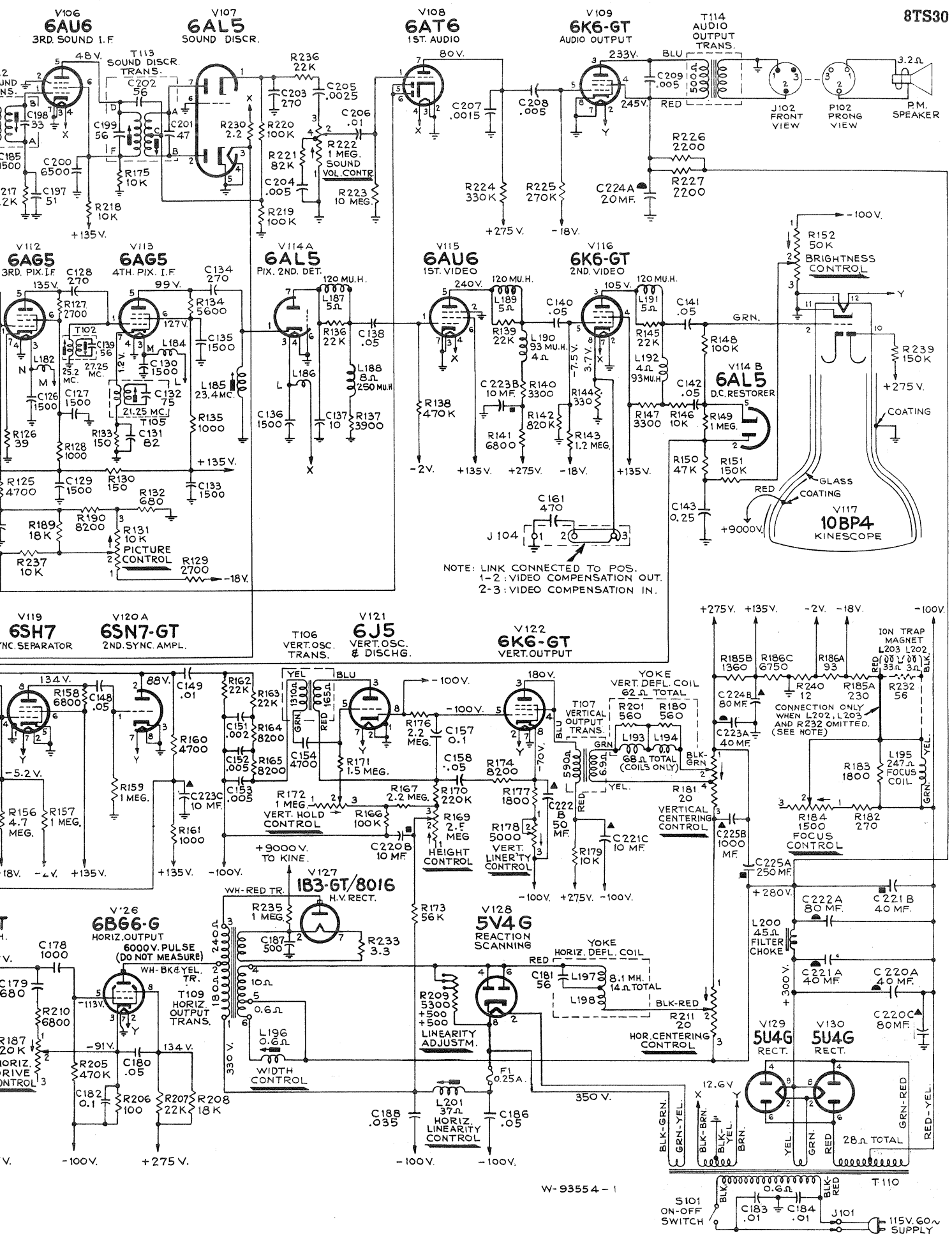



*Figure 20—Circuit Schematic Diagram*

| STOCK No. | DESCRIPTION |
|---|---|
| | **R-F UNIT ASSEMBLY KRK2** |
| 71504 | Capacitor—Ceramic, 0.68 mmf. (C13) |
| 71500 | Capacitor—Ceramic, 1.5 mmf. (C3, C4) |
| 71502 | Capacitor—Ceramic, 2.2 mmf. (C10) |
| 71520 | Capacitor—Ceramic, 4.7 mmf. (C6, C7, C12) |
| 45466 | Capacitor—Ceramic, 10mmf. (C19) |
| 33101 | Capacitor—Ceramic, 22 mmf. (C14) |
| 71540 | Capacitor—Ceramic, 270 mmf. (C1, C2) |
| 65401 | Capacitor—Mica, 270 mmf. (C18) |
| 71501 | Capacitor—Ceramic, 1500 mmf. (C5, C8, C9, C11, C17) |
| 72122 | Coil—Channel #1 r-f amplifier plate coil—front or rear section or channel #1 converter grid coil—front or rear section (L1, L2, L27, L28) |
| 71479 | Coil—Channel #2 r-f amplifier plate coil—front or rear section or channels #2 and #4 converter grid coil—front or rear section (L3, L4, L29, L30, L33, L34) |
| 71480 | Coil—Channel #4 r-f amplifier plate coil—front or rear section (L7, L8) |
| 71481 | Coil—Channel #5 r-f amplifier plate coil—front or rear section or channel #5 converter grid coil—front or rear section (L9, L10, L35, L36) |
| 71492 | Coil—Channel #6 oscillator, converter grid or r-f amplifier plate coil—front or rear sections (L11, L12, L37, L38, L63, L64) |
| 71491 | Coil—Channel #13 converter grid or r-f amplifier plate coil—rear section (L25, L51) |
| 71490 | Coil—Channel #13 converter grid or r-f amplifier plate coil—front section (L26, L52) |
| 72597 | Coil—Channel #3 converter grid coil—front or rear section and channel #3 r-f amplifier plate coil—front or rear section (L5, L6, L31, L32) |
| 71469 | Coil—Channel #1 oscillator coil—front or rear section (L53, L54) |
| 71471 | Coil—Channel #5 oscillator coil—front section or channel #2 oscillator coil—rear section (L55, L62) |
| 71470 | Coil—Channels #2, 3 and 4 oscillator coil—front sections (L56, L58, L60) |
| 72552 | Coil—Channel #3 oscillator coil—rear section (L57) |
| 72553 | Coil—Channel #4 oscillator coil—rear section (L59) |
| 71472 | Coil—Channel #5 oscillator coil—rear section (L61) |
| 71489 | Coil—Channel #13 oscillator coil—rear section (L77) |
| 71488 | Coil—Channel #13 oscillator coil—front section (L78) |
| 71505 | Coil—Heater choke coil (L79) |
| 71506 | Coil—Converter grid i-f choke coil (L80) |
| 71493 | Connector—Segment connector |
| 71597 | Core—Channel #13 front and rear oscillator coils' adjustable core and stud |
| 71498 | Core—Channels #6 and #13 front and rear converter grid coils or front and rear r-f amplifier plate coils' adjustable core and stud |
| 71497 | Core—Channel #6 front and rear oscillator coils' adjustable core and stud |
| 72743 | Detent—Detent mechanism and fibre shaft |
| 71465 | Disc—Rotor disc for fine tuning control (Part of C15) |
| 72744 | Drive—Fine tuning pinch washer drive |
| 71487 | Form—Coil form only for channels #6 and #13 coils—less winding |
| 71462 | Loop—Oscillator to converter grid coupling loop |
| | Resistor—Fixed composition, 47 ohms ±20%, ½ watt (R8) |
| | Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R3, R11, R13) |
| | Resistor—Fixed composition, 1000 ohms ±20%, ½ watt (R4, R12, R14) |
| | Resistor—Fixed composition, 4700 ohms ±20%, ½ watt (R1, R2, R7) |
| | Resistor—Fixed composition, 10,000 ohms ±10%, ½ watt (R5) |
| | Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R9, R10) |
| | Resistor—Fixed composition, 1 megohm ±20%, ½ watt (R6) |
| 14343 | Ring—Retaining ring for drive |
| 71475 | Screw—#4-40 x 15/32" adjusting screw for coils L54, L56, L58, L60, L62 |
| 71476 | Screw—#4-40 x ¼" binder head screw for adjusting coils L66, L68, L70, L72, L74, L76 |
| 71473 | Segment—Converter grid section front segment—less coils or r-f amplifier plate section front segment—less coils (Part of S2, S3) |
| 71474 | Segment—Converter grid section rear section less coils or r-f amplifier plate section rear segment—less coils (Part of S2, S3) |
| 71467 | Segment—Oscillator section front segment—less coils (Part of S4) |
| 71468 | Segment—Oscillator segment rear section—less coils (Part of S4) |
| 72951 | Shield—Lead tube shield for V3 |
| 71494 | Socket—Tube socket—miniature |
| 71461 | Spring—Snap spring to hold fine tuning shaft |
| 71466 | Stator—Oscillator fine tuning stator and bushing (Part of C15) |
| 71507 | Transformer—Antenna transformer (T1) |
| 71495 | Transformer—Converter transformer (T2, C16) |
| 73239 | Trap—Antenna trap (L81, L82, C21, C22) |
| | **TELEVISION CHASSIS KCS20J-1, KCS20K-2** |
| 71894 | Bearing—Bearing assembly for R-F Unit shaft |
| 71460 | Board—Antenna board |
| 72615 | Capacitor—Mica, 10 mmf. (C137) |
| 71771 | Capacitor—Ceramic, 51 mmf. (C197) |
| 73090 | Capacitor—Mica, 82 mmf. (C166) |
| 71514 | Capacitor—Ceramic, 82 mmf. (C131) |
| 73091 | Capacitor—Mica, 270 mmf. (C116, C123, C128, C134, C145, C147, C203) |
| 39642 | Capacitor—Mica, 390 mmf. (C176) |
| 39644 | Capacitor—Mica, 470 mmf. (C161) |
| 71450 | Capacitor—High-voltage capacitor, 500 mmf. (C187) |
| 39648 | Capacitor—Mica, 680 mmf. (C179) |
| 72638 | Capacitor—Ceramic, 1200 mmf. (C164) |
| 71501 | Capacitor—Ceramic, 1500 mmf. (C112, C113, C114, C115, C118, C119, C120, C121, C122, C126, C127, C129, C130, C133, C135, C136, C185, C189, C191, C194, C196) |
| 72524 | Capacitor—Mica, 4700 mmf. (C154) |
| 71690 | Capacitor—Ceramic, 6500 mmf. (C200) |
| 71394 | Capacitor—Tubular, .0015 mfd., 600 volts (C207) |
| 70602 | Capacitor—Tubular, .0025 mfd., 400 volts (C205) |
| 70642 | Capacitor—Tubular, .001 mfd., 1000 volts (C178) |
| 70601 | Capacitor—Tubular, .002 mfd., 400 volts (C151) |
| 70605 | Capacitor—Tubular, .004 mfd., 400 volts (C167, C172) |
| 70647 | Capacitor—Tubular, .004 mfd., 1000 volts (C173) |
| 70606 | Capacitor—Tubular, .005 mfd., 400 volts (C152, C204, C208) |
| 70627 | Capacitor—Tubular, .005 mfd., 600 volts (C209) |
| 71516 | Capacitor—Tubular, oil impregnated, .015 mfd., 400 volts (C168, C169) |
| 73100 | Capacitor—Tubular, oil impregnated, .035 mfd., 1000 volts (C188) |
| 71770 | Capacitor—Moulded paper, .01 mmfd., 400 volts (C183, C184) |
| 70610 | Capacitor—Tubular, .01 mfd., 400 volts (C149, C177, C192, C206) |
| 70615 | Capacitor—Tubular, .05 mfd., 400 volts (C138, C144, C148, C170) |
| 70636 | Capacitor—Tubular, .05 mfd., 600 volts (C140, C141, C142, C174, C175, C180) |
| 71515 | Capacitor—Tubular, oil impregnated, .05 mfd., 600 volts (C158) |
| 73093 | Capacitor—Tubular, oil impregnated, .05 mfd., 1000 volts (C186) |
| 70617 | Capacitor—Tubular, 0.1 mfd., 400 volts (C157, C182) |
| 70638 | Capacitor—Tubular, 0.1 mfd., 600 volts (C146) |
| 70618 | Capacitor—Tubular, 0.25 mfd., 400 volts (C125, C143) |
| 71432 | Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts, and 1 section of 10 mfd., 450 volts (C221A, C221B, C221C) |
| 71433 | Capacitor—Electrolytic, comprising 1 section of 80 mfd., 450 volts and 1 section of 50 mfd., 50 volts (C222A, C222B) |
| 71434 | Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts, and 1 section of 10 mfd., 350 volts (C223A, C223B, C223C) |

## REPLACEMENT PARTS (Continued)

| STOCK No. | DESCRIPTION |
|---|---|
| 71431 | Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts, and 1 section of 80 mfd., 150 volts (C220A, C220B, C220C) |
| 71435 | Capacitor—Electrolytic, comprising 1 section of 20 mfd., 450 volts, and 1 section of 80 mfd., 350 volts (C224A, C224B) |
| 71436 | Capacitor—Electrolytic, comprising 1 section of 250 mfd., 10 volts, and 1 section of 1000 mfd., 6 volts (C225A, C225B) |
| 73154 | Choke—Filter choke (L200) |
| 71505 | Coil—Choke coil (L180, L181, L182, L184, L186) |
| 71421 | Coil—Focus coil (L195) |
| 71449 | Coil—Horizontal linearity control coil (L201) |
| 71526 | Coil—Peaking coil (L188) |
| 71529 | Coil—Peaking coil (L187, L189, L191, R136, R139, R145) |
| 71527 | Coil—Peaking coil (L190, L192) |
| 71426 | Coil—Fourth picture i-f coil (L185) |
| 71429 | Coil—Width control coil (L196) |
| 71523 | Connector—Anode connector |
| 71521 | Contact—High-voltage capacitor lead contact |
| 73156 | Control—Brightness control (R152) |
| 71442 | Control—Focus control (R184) |
| 71440 | Control—Height control (R169) |
| 71447 | Control—Horizontal drive control (R187) |
| 72734 | Control—Vertical and horizontal hold control (R168, R172) |
| 71443 | Control—Vertical and horizontal centering control (R181, R211) |
| 71441 | Control—Vertical linearity control (R178) |
| 73157 | Control—Picture control, volume control and power switch (R131, R222, S101) |
| 71457 | Cord—Power cord and plug |
| 71437 | Cover—Insulating cover for electrolytics #71431 and #71433 |
| 71509 | Cushion—Deflection yoke hood upper cushion |
| 71510 | Cushion—Deflection yoke hood lower cushion |
| 73600 | Fuse—0.25 ampere, 250 volts (F1) |
| 73155 | Grommet—Rubber grommet for anode connector and kine. grid lead holes |
| 71522 | Magnet—Ion trap magnet (EM type) (L202, L203) |
| 73301 | Magnet—Ion trap magnet (PM type) |
| 71455 | Nut—#8-32 wing nut for mounting focus coil (3 required) |
| 71451 | Nut—Speed nut to mount high-voltage capacitor |
| 18469 | Plate—Bakelite mounting plate for electrolytics #71431 and #71433 |
| 5119 | Plug—3 contact female plug for speaker cable |
| 71448 | Plug—2 prong male plug for power cable |
| 71918 | Resistor—Wire wound, 2.2 ohms, 1 watt (R230) |
| 71513 | Resistor—3.3 ohms, 1/3 watt (R233) |
| | Resistor—Fixed composition, 10 ohms ±10%, ½ watt (R194) |
| 73098 | Resistor—Wire wound, 12 ohms, 1 watt (R240) |
| | Resistor—Fixed composition, 39 ohms ±10%, ½ watt (R116, R121, R126) |
| | Resistor—Fixed composition, 56 ohms ±10%, 1 watt (R232), in some sets |
| | Resistor—Fixed composition, 100 ohms ±10%, 2 watts (R206) |
| | Resistor—Fixed composition, 100 ohms ±20%, ½ watt (R212, R215) |
| | Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R114, R119, R124, R130, R133) |
| 39505 | Resistor—Wire wound, 270 ohms, 2 watts (R182) |
| | Resistor—Fixed composition, 330 ohms ±10%, ½ watt (R144) |
| | Resistor—Fixed composition, 560 ohms ±10%, ½ watt (R195) |
| | Resistor—Fixed composition, 680 ohms ±10%, ½ watt (R132) |
| | Resistor—Fixed composition, 1000 ohms ±20%, ½ watt (R117, R118, R122, R123, R128, R135, R213, R216) |
| | Resistor—Fixed composition, 1000 ohms ±10%, ½ watt (R161) |
| | Resistor—Fixed composition, 1800 ohms ±10%, ½ watt (R177) |
| 71512 | Resistor—Wire wound, 1800 ohms, 1 watt (R183) |
| | Resistor—Fixed composition, 2200 ohms ±20%, 2 watts (R226, R227) |
| | Resistor—Fixed composition, 2700 ohms ±10%, ½ watt (R129) |
| | Resistor—Fixed composition, 2700 ohms ±5%, ½ watt (R127) |
| | Resistor—Fixed composition, 3300 ohms ±20%, ½ watt (R234) |
| | Resistor—Fixed composition, 3300 ohms ±10%, 1 watt (R147) |
| | Resistor—Fixed composition, 3300 ohms ±10%, ½ watt (R140) |
| | Resistor—Fixed composition, 3900 ohms ±5%, ½ watt (R137) |
| | Resistor—Fixed composition, 4700 ohms ±10%, ½ watt (R160) |
| | Resistor—Fixed composition, 4700 ohms ±5%, ½ watt (R125) |
| | Resistor—Fixed composition, 4700 ohms ±10%, 1 watt (R154, R155) |
| 45876 | Resistor—Wire wound, 5000 ohms, 5 watts (R200) |
| | Resistor—Fixed composition, 5600 ohms ±5%, ½ watt (R134) |
| | Resistor—Fixed composition, 6800 ohms ±10%, ½ watt (R141, R158, R202, R210) |
| | Resistor—Fixed composition, 8200 ohms ±10%, ½ watt (R164, R165, R190) |
| | Resistor—Fixed composition, 8200 ohms ±5%, ½ watt (R174) |
| | Resistor—Fixed composition, 10,000 ohms ±10%, ½ watt (R146, R175, R237) |
| | Resistor—Fixed composition, 10,000 ohms ±5%, ½ watt (R115, R120) |
| | Resistor—Fixed composition, 10,000 ohms ±20%, 1 watt (R179) |
| | Resistor—Fixed composition, 10,000 ohms ±10%, 1 watt (R199, R218) |
| | Resistor—Fixed composition, 18,000 ohms ±10%, ½ watt (R189) |
| | Resistor—Fixed composition, 18,000 ohms ±10%, 1 watt (R208) |
| | Resistor—Fixed composition, 22,000 ohms ±20%, ½ watt (R162, R163, R236) |
| | Resistor—Fixed composition, 22,000 ohms ±10%, ½ watt (R217) |
| | Resistor—Fixed composition, 22,000 ohms ±10%, 1 watt (R207) |
| | Resistor—Fixed composition, 27,000 ohms ±10%, ½ watt (R196) |
| | Resistor—Fixed composition, 27,000 ohms ±10%, 1 watt (R188) |
| | Resistor—Fixed composition, 39,000 ohms ±10%, 1 watt (R197) |
| | Resistor—Fixed composition, 39,000 ohms ±5%, 1 watt (R231) |
| | Resistor—Fixed composition, 47,000 ohms ±10%, ½ watt (R150) |
| | Resistor—Fixed composition, 47,000 ohms ±10%, 1 watt (R198) |
| | Resistor—Fixed composition, 56,000 ohms ±10%, ½ watt (R173) |
| | Resistor—Fixed composition, 82,000 ohms ±10%, ½ watt (R221) |
| | Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R148) |
| | Resistor—Fixed composition, 100,000 ohms ±10%, ½ watt (R166, R219, R220) |
| | Resistor—Fixed composition, 150,000 ohms ±20%, ½ watt (R239) |
| | Resistor—Fixed composition, 150,000 ohms ±10%, ½ watt (R151) |
| | Resistor—Fixed composition, 220,000 ohms ±20%, ½ watt (R203) |
| | Resistor—Fixed composition, 220,000 ohms ±10%, ½ watt (R170) |

# REPLACEMENT PARTS (Continued)

| STOCK No. | DESCRIPTION |
|---|---|
| | Resistor—Fixed composition, 270,000 ohms ±10%, ½ watt (R225) |
| | Resistor—Fixed composition, 470,000 ohms ±20%, ½ watt (R138, R193, R214) |
| | Resistor—Fixed composition, 470,000 ohms ±10%, ½ watt (R191, R192, R205) |
| | Resistor—Fixed composition, 330,000 ohms ±20%, ½ watt (R224) |
| | Resistor—Fixed composition, 680,000 ohms ±5%, ½ watt (R204, R238) |
| | Resistor—Fixed composition, 820,000 ohms ±5%, ½ watt (R142) |
| 71458 | Resistor—Wire wound, comprising 1 section of 1360 ohms, 17 watts, and 1 section of 230 ohms, 10 watts (R185A, R185B) |
| 71439 | Resistor—Wire wound, comprising 1 section of 5300 ohms, 20 watts, and 2 sections of 500 ohms, 2 watts (R209) |
| 73097 | Resistor—Voltage divider, comprising 1 section of 6750 ohms, 3.2 watts, and 1 section of 93 ohms, 4 watts (R186) |
| | Resistor—Fixed composition, 1 megohm ±20%, ½ watt (R149, R153, R159) |
| | Resistor—Fixed composition, 1 megohm ±10%, ½ watt (R157, R229) |
| | Resistor—Fixed composition, 1 megohm ±10%, 1 watt (R235) |
| | Resistor—Fixed composition, 1.2 megohms ±5%, ½ watt (R143) |
| | Resistor—Fixed composition, 1.5 megohms ±5%, ½ watt (R171) |
| | Resistor—Fixed composition, 2.2 megohms ±10%, ½ watt (R167, R176) |
| | Resistor—Fixed composition, 4.7 megohms ±10%, ½ watt (R156) |
| | Resistor—Fixed composition, 6.8 megohms ±10%, ½ watt (R228) |
| | Resistor—Fixed composition, 10 megohms ±20%, ½ watt (R223) |
| 71456 | Screw—Wing screw for mounting deflection yoke |
| 71452 | Sleeve—Rubber sleeve for focus coil |
| 71559 | Spring—Grounding spring for high-voltage capacitor |
| 71525 | Socket—Kinescope socket |
| 72516 | Socket—Tube socket, miniature |
| 31251 | Socket—Tube socket, wafer |
| 71508 | Socket—Tube socket for 8016 |
| 71453 | Stud—Threaded stud for focus coil mounting brackets (2 required) |
| 71423 | Transformer—First picture i-f transformer (T103, C117) |
| 71425 | Transformer—Second picture i-f transformer (T104, C124) |
| 73708 | Transformer—Third picture i-f trans. (T102, C139) |
| 71418 | Transformer—Vertical oscillator transformer (T106) |
| 71417 | Transformer—Vertical output transformer (T107) |
| 71428 | Transformer—Horizontal oscillator transformer (T108) |
| 71416 | Transformer—Horizontal output and high-voltage transformer (T109) |
| 72775 | Transformer—Power transformer, 115 volt, 50 cycle (T110) |
| 71415 | Transformer—Power transformer, 115 volt, 60 cycle (T110) |
| 71424 | Transformer—First or second sound i-f transformer (T111, T112, C190, C193, C195, C198) |
| 71427 | Transformer—Sound discriminator transformer (T113, C199, C201, C202) |
| 71419 | Transformer—Audio output transformer (T114) |
| 71422 | Trap—Sound trap (T105, C132) |
| 71420 | Yoke—Deflection yoke (L193, L194, L197, L198, C181, R180, R201) |
| | **SPEAKER ASSEMBLIES 92573-2** |
| 73236 | Speaker—5" x 7" PM speaker complete with cone and voice coil |
| | **MISCELLANEOUS** |
| 73709 | Back—Cabinet back—Masonite |
| X1751 | Cloth—Grille cloth |
| 73232 | Decal—Control function decal for toasted mahogany instruments |
| 71983 | Decal—Control function decal (Off-On Sound and Station Selector) for walnut and mahogany instruments |
| 71982 | Decal—Control function decal (Brightness and Horizontal-Vertical) for walnut and mahogany instruments |
| 73221 | Escutcheon—Channel marker escutcheon for toasted mahogany instruments |
| 73220 | Escutcheon—Channel marker escutcheon for walnut and mahogany instruments |
| 72113 | Foot—Cabinet foot—rubber (4 required) |
| 73177 | Glass—Safety glass |
| 73222 | Knob—Fine tuning control knob (burgundy) for walnut and mahogany instruments |
| 73223 | Knob—Fine tuning control knob (tan) for toasted mahogany instruments |
| 73226 | Knob—Picture control, brightness control, or vertical hold control knob (burgundy) for walnut and mahogany instruments |
| 73227 | Knob—Picture control, brightness control or vertical hold control knob (tan) for toasted mahogany instruments |
| 73224 | Knob—Station selector knob (burgundy) for walnut and mahogany instruments |
| 73225 | Knob—Station selector knob (tan) for toasted mahogany instruments |
| 73228 | Knob—Volume control and power switch or horizontal hold control knob (burgundy) for walnut and mahogany instruments |
| 73229 | Knob—Volume control and power switch or horizontal hold control knob (tan) for toasted mahogany instruments |
| 73230 | Knob—Brightness control knob (burgundy) for walnut and mahogany instruments |
| 73231 | Knob—Brightness control knob (tan) for toasted mahogany instruments |
| 73180 | Name Plate—"RCA-Victor" name plate |
| 71539 | Slide—Kinescope centering slide complete with rubber cushion (4 required) |
| 71538 | Spring—Channel marker escutcheon spring |
| 72845 | Spring—Retaining spring for knobs #73222 and #73223 |
| 14270 | Spring—Retaining spring for knobs #73224, #73225, #73226, #73227, #73230 and #73231 |
| 30330 | Spring—Retaining spring for knobs #73228 and #73229 |
| 73178 | Trim—Grille trim—L. H. |
| 73179 | Trim—Grille trim—R. H. |

**Note:** A few early production instruments were supplied with the type of escutcheon and knobs employed by the Model 630TS Receiver. These items are listed below.

| | |
|---|---|
| 71598 | Escutcheon—Channel marker escutcheon |
| 71535 | Knob—Picture, brightness or vertical hold knob |
| 71537 | Knob—Dummy brightness control knob |
| 71533 | Knob—Fine tuning knob |
| 71536 | Knob—Horizontal hold or volume control knob |
| 71534 | Knob—Station selector knob |
| 71538 | Spring—Spring clip fo rescutcheon |
| 4982 | Spring—Retaining spring for knob #71533 |
| 14270 | Spring—Retaining spring for knob #71534, #71535 and #71537 |
| 30330 | Spring—Retaining spring for knob #71536 |

To obtain resistors for which no stock number is given, order by stating type, value of resistance, tolerance and wattage.

**APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS**

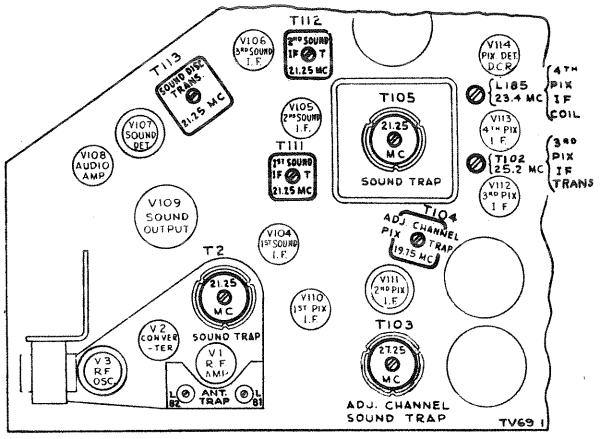
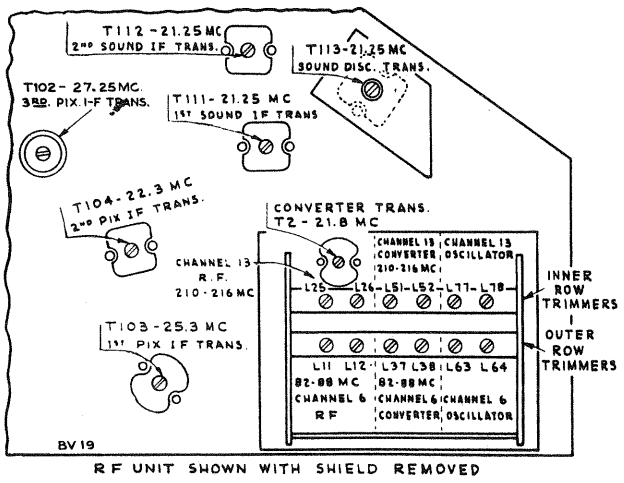



*Figure 12—Top Chassis Adjustments*




RF UNIT SHOWN WITH SHIELD REMOVED

*Figure 13—Bottom Chassis Adjustments*

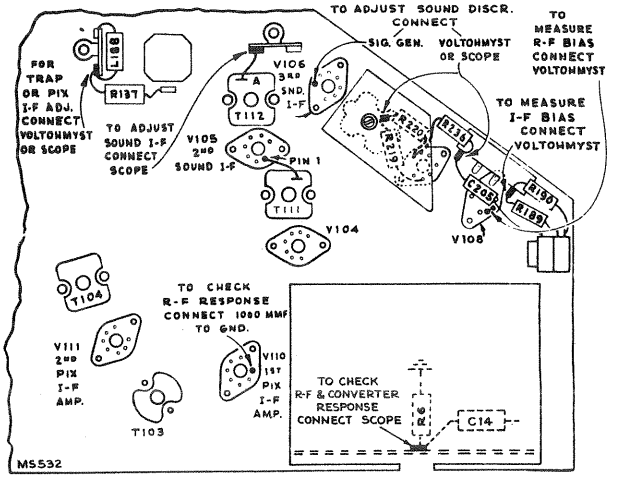
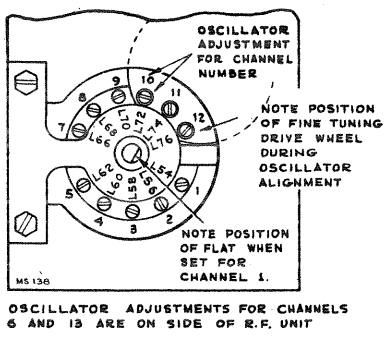



*Figure 14—Test Connection Points*




OSCILLATOR ADJUSTMENTS FOR CHANNELS 6 AND 13 ARE ON SIDE OF R.F. UNIT

*Figure 15—R-F Oscillator Adjustments*

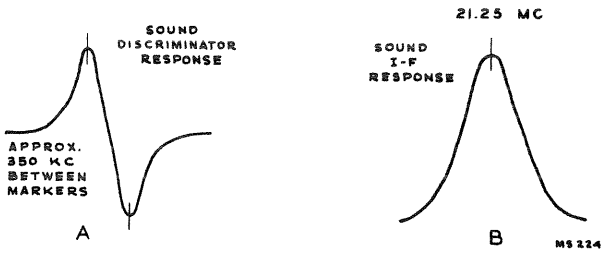



*Figure 16—Sound Discriminator and I-F Response*

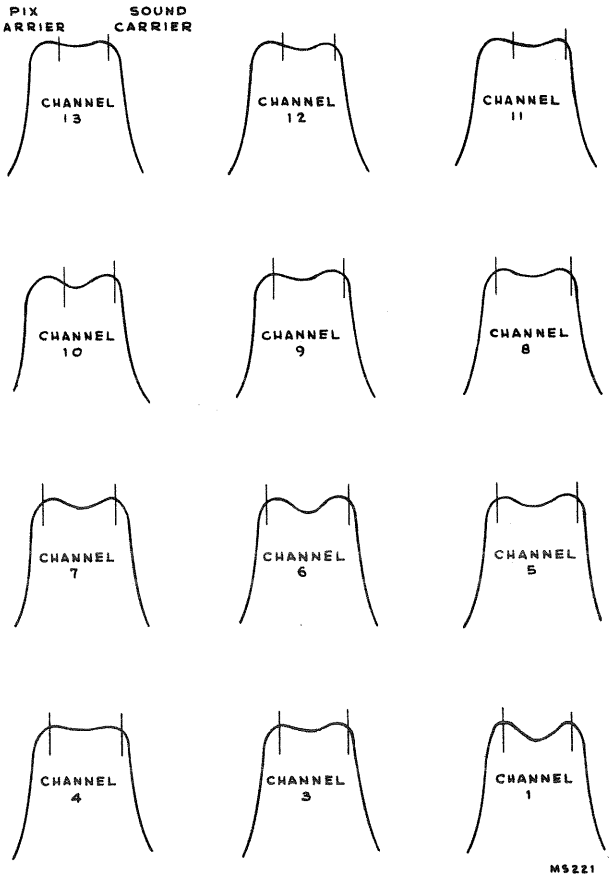



*Figure 17—R-F Response*

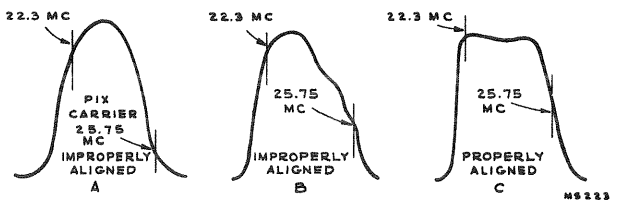



*Figure 18—Overall Response*